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# Railway Age Gazette

SECOND HALF OF 1917—No. 7

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# Railway Age Gazette

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We publish elsewhere two very interesting and important addresses on the part of the railways in the war. One is

### Two Addresses on the Railways in the War

by Daniel Willard, president of the Baltimore & Ohio, and chairman of the Advisory Commission on National Defense. The other is by E. E. Clark, a member of the Interstate Commerce Commission. Both Mr. Willard as chairman of the Advisory Commission and Mr. Clark as the representative of the Interstate Commerce Commission have been sitting with the Railroads' War Board and participating in its deliberations. No other man in the United States is better informed regarding the war problems confronting the people of the country or the part which the railways ought to and must play in the solution of those problems than Mr. Willard, and it is to be wished that his address could be read not only by every railway officer and employee, but also by every citizen. It is a very able and remarkable document and coming from such a source it ought to stimulate every reader of it to help the railways in every way practicable to do their bit. No other public officer is so well informed regarding what the railways are doing under the supervision of the Railroads' War Board to perform their duty to the country as is Mr. Clark, and therefore his cordial endorsement of the objects being sought and the methods being used is gratifying and full of promise as to the prospects of the close co-operation which doubtless will be needed in future between the war board and the Interstate Commerce Commission.

Such railroads as have adopted modern apprenticeship methods in their mechanical departments (and the number

### Intensive Training of New Employees

is discouragingly small) have looked largely to the future for results, rather than for any immediate returns. The facts that were marshalled by John H. Linn in the article on "By-Products of an Apprenticeship System," which was published in the *Railway Age Gazette* of August 10, 1917, indicate that the Santa Fe received many concrete returns from the very beginning of the installation of the new apprenticeship system; in-

deed, these by-product returns in the aggregate were probably sufficient to justify the movement on a strictly business basis, without reference to the main result which it was desired to accomplish. Passing reference only was made to one advantage which is of special importance at this time. Railroads generally have had to employ many new hands in the mechanical department, and whether these are mature men, or girls and women, the apprenticeship organization can readily be adapted to give them intensive practical training and rapidly fit them for the efficient performance of their duties. Moreover, it should be comparatively easy to adapt and extend methods of training which have proved successful in the mechanical department to other departments. Unless immediate and adequate steps are taken to train new employees in all departments the effectiveness of the railroads at large may be greatly hampered. It is unfortunate that so few roads have awakened to their full responsibilities in this direction, and it is sincerely to be hoped that those which have lagged behind will make a prompt and decided effort to catch up with the leaders.

The average freight rate per ton per mile received by the railways of the United States in 1916, 7.16 mills, was the lowest on record. This fact, indicated by the preliminary summary of returns for roads earning over \$1,000,000 a year issued by the Bureau of Railway Economics in February and commented upon in these columns at the time, is now officially confirmed by the abstract of statistics for the fiscal year ended June 30, 1916, just issued by the Interstate Commerce Commission. For the million dollar roads the average receipts per ton mile were 7.07 mills, as compared with 7.22 for the previous year. The commission's figures cover all roads in the country having total operating revenues of over \$100,000 a year. The average of 7.16 mills in 1916 compares with 7.32 in 1915, 7.33 in 1914, and 7.29 in 1913. Never before, since the Interstate Commerce Commission began publishing railway statistics, has the average revenue per ton mile been below 7.24, which was the figure for 1899. In 1891, the earliest year for which the commission has the

record, the average was 8.95 mills. Until 1899 there was a general decline and from that year until 1904 there was an increase to 7.80 mills. Since that year the average has pretty steadily declined. The average revenue per ton per mile for freight for each year from 1891 to 1916 as reported by the commission has been as follows:

1891..... 8.95 mills	1900..... 7.29 mills	1909..... 7.63 mills
1892..... 8.98 mills	1901..... 7.50 mills	1910..... 7.53 mills
1893..... 8.78 mills	1902..... 7.57 mills	1911..... 7.57 mills
1894..... 8.60 mills	1903..... 7.63 mills	1912..... 7.44 mills
1895..... 8.39 mills	1904..... 7.80 mills	1913..... 7.29 mills
1896..... 8.06 mills	1905..... 7.66 mills	1914..... 7.33 mills
1897..... 7.98 mills	1906..... 7.48 mills	1915..... 7.32 mills
1898..... 7.53 mills	1907..... 7.59 mills	1916..... 7.16 mills
1899..... 7.24 mills	1908..... 7.54 mills	

The decrease in 1916 is probably attributable mainly to the increase in the proportion of low-rated commodities during the year, principally of coal and other products of mines. The commission's report also shows that the average operating expenses per train mile increased from \$1.77 in 1915 to \$1.83 in 1916. The fact that the railways were able to show the largest gross and net earnings in their history in the face of such an increase in operating costs while receiving a lower average rate than ever before is therefore attributable to a remarkable increase in efficiency of operation. How this was accomplished is illustrated in the commission's report by the fact that the average number of tons of freight carried in each train was increased from 474.45 in 1915 to 534.95 in 1916.

### THE BURLINGTON'S EXTRA DIVIDEND

THE declaration by the Chicago, Burlington & Quincy Railroad Company of an extra dividend of 10 per cent will be the subject of much discussion. Whether those who discuss it will approve or disapprove of the action taken will depend on the relative amounts of stress that they put on a railway's function as a business concern and its function as a public service concern.

A railway, the courts have held, is private property affected with a public use. There was a time when railway owners entirely subordinated the public duties of the railway to the object of making money out of it as private property. More recently not only the regulating authorities, but even the owners and the managers of the railways, have to a large extent subordinated the purely business or money-making side of the railroad to its function as a public utility.

The case of the Burlington is a good illustration of the extent to which for some years the railway as private property has been subordinated to the railway as a public servant. The road was laid out and has been developed with great strategic skill. It has been managed with almost unsurpassed progressiveness and ability and it has been conducted financially with great conservatism. Although it has always been one of the most important of the granger systems, its average capitalization per mile on the basis of mileage owned at the end of the year 1916 was only \$31,854, and on the basis of mileage operated it was only \$30,600. Its total earnings, its operating efficiency and its net earnings have steadily increased, while there has been practically no increase in its funded debt. The percentages earned by it on its stock—after the payment of interest on funded debt, of course—in the eight fiscal years ending with June 30, 1916, were as follows: 1909, 11.74 per cent; 1910, 12.6 per cent; 1911, 15.79 per cent; 1912, 13.32 per cent; 1913, 18.12 per cent; 1914, 16.97 per cent; 1915, 17.18 per cent; 1916, 26.93 per cent. The fiscal year was changed last year to correspond with the calendar year, and in the year ended on December 31, 1916, the earnings on the stock were almost 29 per cent.

An extra dividend of 6 per cent was paid on October 1, 1907, but since then, in spite of the large earnings made, the same dividend—at the rate of 8 per cent—has been paid on the same amount of stock. What has been done with the

rest of the money? From \$655,000 to \$1,817,000 a year has been applied to sinking funds and from \$2,268,000 to \$7,648,000 a year has been appropriated for additions and betterments. Meantime, the property has been so maintained that it has been getting into better and better condition.

Certainly any concern in any other line of business which could show such a record for efficient management and financial conservatism over a long period of years would not be criticised on business or any other grounds for declaring an extra dividend of 10 per cent.

But what of the public policy involved? Will not the management of the Burlington be criticised for declaring this extra dividend, and will not it tend to arouse a popular antagonism to railways which will do them all harm? The Burlington is a granger road operating in a territory where popular hostility to railways is and always has been greater than in any other section of the country, and undoubtedly its action in declaring this extra dividend under present conditions will draw criticism upon its management and will also be made a ground for attacking the managements of railways generally.

But, as a matter of fact, the large earnings which the Burlington has been making have constantly over a long period of years been used by critics of the railways to show that the railways generally were more prosperous than they admitted that they were and that therefore their rates ought to be reduced instead of increased. Perhaps there will be no more criticism because the Burlington has declared this dividend than there has been because it has been earning enough money to declare it.

Meantime, the facts should be pointed out that the Burlington is not a typical railroad in any respect whatever. Its capitalization per mile is so small in relation to the total traffic handled, to its total earnings and to its net operating income that if the rates in its territory were so regulated as to restrict its net operating income to 6 or 7 per cent, it would soon be about the only solvent railway left in the territory. It may be said, however, that even though this is the case it should use the earnings on its stock in excess of its 8 per cent dividend to develop its property in order that it may render more and better public service. But this is precisely what it has been doing for ten years, and this extra dividend spread over that period makes an average of only 9 per cent that it has paid.

So long as the public does not fix a minimum return which railways will be allowed to earn and pay, it has no moral right to fix a maximum return which they may earn and pay. As a matter of business policy the action of the Burlington in declaring the extra dividend is perfectly sound and defensible. As a matter of railroad public policy, having in mind the railroad situation of the country as a whole, it is questionable if it was expedient.

### ANOTHER HEAVIEST ENGINE

THE gradual increase in the weight of locomotives is ever a matter of vital concern to the bridge engineer. He is not only responsible for the safety of bridges under the loads imposed by new locomotives purchased by his road and by new engines in transit to other roads, but he has ever before him the perplexing problem of the designing load for new bridges. This must be great enough to insure adequacy of the structures for many years to come and yet not so great as to result in extravagance for which he may later be criticized not unjustly.

Unfortunately there is no direct relation between the weight of the locomotive and its capacity to produce stress in a structure. Even an expression of the average weight of the engine per foot of track is of little value. The only reliable criterion is a determination of the actual bending moments and shears for spans of varying length and a com-



parison of these with the equivalent results secured with the arbitrary Cooper's loading commonly used in designing. For the design of shorter spans or the floor systems of bridges, the magnitude of the individual axle loads together with the dynamic augment of the over balance are the determining factors rather than the weight of the entire locomotive, but these also involve analyses along the lines outlined above which are withal tedious and expensive.

Results of such analyses show that the Santa Fe type locomotives produce generally higher loading effects on spans under 60 ft. in length than locomotives of the Mallet class. A monograph by A. C. Irwin, in the proceedings of the American Railway Engineering Association for 1915, showed that 2-10-2 locomotives purchased by the Burlington in 1912 gave a classification equivalent to Cooper's E-66 for a span of 50 ft., higher than that obtained for any span with any locomotive other than the Erie triplex and the 2-10-10-2 Mallet of the Atchison, Topeka & Santa Fe, both of them exceptional engines in special service. In view of this, particular interest is attached to the Santa Fe type locomotives now in service on the Denver & Rio Grande, the heaviest of this class built thus far, which were described in the *Railway Age Gazette* of August 3, page 189. These locomotives produce loading effects equivalent to Cooper's E-68 for spans of 30 ft. to 60 ft. inclusive.

This is not a phenomenal increase for a period of five years, but it demonstrates clearly that while the general tendency is toward an increase in the length of locomotives to attain greater power, the limit of the weight to be applied within the limits of one set of coupled wheels has not yet been reached. What this limit will be, how much greater the load to be placed on a single driving axle and what reduction can be made in the dynamic augment are the questions which perplex the bridge engineer today, rather than the ultimate total weight to be secured in some multiplex locomotive of extended length.

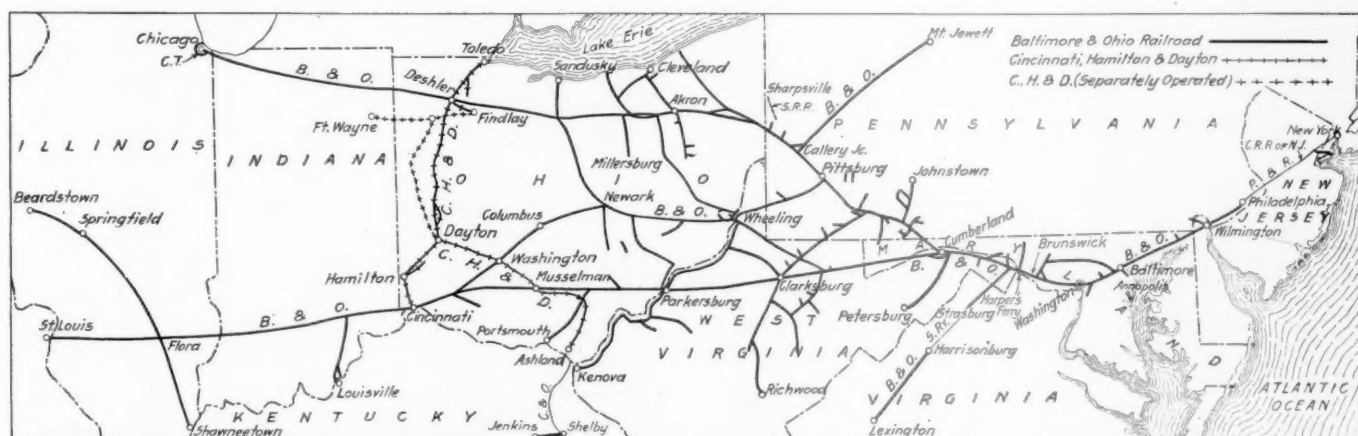
### BALTIMORE & OHIO

**I**F a man had a business that was earning \$90,000 a year in 1910 and bringing him in a net income of well over \$16,000 a year, and between 1910 and 1917 borrowed, at 5 per cent interest, \$145,000 for improvements to his plant, besides putting in some of his own money each year, and for the calendar year 1916 did a gross business of \$117,000

000. In the calendar year 1916 it earned \$116,969,000 gross, but had only \$12,563,000 available for dividends. During this period the company had borrowed, through the issue of bonds and equipment trust notes, in round numbers \$146,000,000, and the fact that it was able to get this money at approximately 5 per cent on the average, shows how good the credit of the company was. In all, the company's investment increased during these years \$157,400,000. The difference between \$146,000,000 and \$157,400,000 is accounted for by surplus invested in the property and accrued depreciation charged out in expenses and spent for additions and betterments.

When Daniel Willard went to the Baltimore & Ohio as president he found a contract requiring the taking over by the Baltimore & Ohio of the Cincinnati, Hamilton & Dayton. This was a transaction which, although closely connected with the actual operation of the Baltimore & Ohio, is not, strictly speaking, railroading. Up to the present this transaction has not proved profitable to the Baltimore & Ohio, and of the total \$157,400,000 investment made in 1910-16, \$25,000,000 stands on the books as the amount charged against the Cincinnati, Hamilton & Dayton transaction and on which amount the Baltimore & Ohio is not earning any return. Except for this Cincinnati, Hamilton & Dayton left over contract no one, probably, not excepting Clifford Thorne, would say that under the management of Mr. Willard the Baltimore & Ohio has engaged in any transactions other than the most conscientious production of transportation at the lowest cost of which the plant and organization was capable.

In one sense the operation of the Baltimore & Ohio in the years 1910 to 1916 inclusive has been successful. The additions and betterments which have been made during these years were absolutely essential both to the continued solvency of the Baltimore & Ohio and to its ability to handle the business offered and to perform the service absolutely required from it by its patrons. Even, however, if it had been possible to disregard the necessities of the shipping and traveling public, if \$6,000,000—approximately the increase in costs due to higher wage scales—\$1,500,000—the increase in taxes—and \$6,500,000—the increase in costs of material—had been imposed on the operation of the plant as it stood in 1910, bankruptcy would have been the result sooner or later. The company has, however, actually raised \$146,000,000 at 5 per cent and is earning today its 5 per cent on



The Baltimore & Ohio

but had profits in that year of only \$12,500, we would be inclined to say that there was something wrong either with the business or the management of it. This is exactly analogous to what happened to the Baltimore & Ohio in the period 1910-16, inclusive. In 1910 the company earned \$90,163,000 gross and had available for dividends \$15,832,-

this new money and sufficient to pay 5 per cent on its common stock, with a small surplus—\$2,612,000. Other railroads have been going along somewhat the same path as the Baltimore & Ohio; but there is one particular in which the Baltimore & Ohio is, if not unique, at least very unusual.

The expenditures for additions and betterments are di-





The Chicago division was double tracked (work was begun in previous years and completed in following years).  
A double-track tunnel between Sand Patch and Manila was completed, giving a double-track line from Philadelphia to Chicago, with the exception of uncompleted double-track work on the Chicago division. Two new stations were built and three were enlarged. There were 17 new interlocking plants built and 13 rebuilt. Automatic signals were installed on 65 miles and line control block system installed on 23 miles.

## 1914

A third track between Green Springs and Little Cacapon, W. Va., 7.6 miles, was built, giving a three-track line from Little Cacapon to Patterson Creek, 14.4 miles, where the track density even in 1913 was 20,000,000 ton-miles per mile of road.  
At South Cumberland new engine facilities were built.  
Two new stations were built and one was remodeled.  
There were nine new interlocking plants built, one rebuilt and six rearranged.  
Automatic signals were installed on 176 miles.  
A new concrete warehouse with 155,000 sq. ft. of available storage space was built at New York City.  
An open pier for handling ore at Locust Point was reconstructed and extended.  
A new yard for assembling coal at Somerset, Pa., was completed.

## 1915

The new double-track line and relocation of the old line between Okonoko and Orleans Road, W. Va., known as the Magnolia cut-off, was completed, permitting an increase in eastbound slow freight trainload of 36.36 per cent and shortening the distance 5.78 miles. This gives a three-track road all the way from Patterson Creek to Cherry Run, W. Va., 57 miles, where by 1911 traffic density amounted to 24,000,000 ton-miles per mile of road.  
Two new stations were built.  
There were three interlocking plants built and four reconstructed.  
Automatic signals were installed on 18 miles.  
Various grade crossings were eliminated.  
Bridges at various points were strengthened.

## 1916, to June 30.

A new outbound freight house, was built at New York.  
A new export pier was built at Locust Point, Baltimore, and three open piers were reconstructed.  
A fireproof coal pier with a capacity of 6,000 tons per hour was built, although not completed, at Curtis Bay, Baltimore.  
The Pittsburgh passenger station was remodeled and four new stations were built at various points.  
Automatic signals were installed on 48 miles of road.  
Two interlocking plants were built.

## 1916, June 30 to December 31

A new yard was built at Somerset, Pa.  
The last of the double tracking of the Chicago division was almost completed.  
Automatic signals were installed on 82 miles.

A part of the \$62,000,000 spent for equipment was for passenger service equipment and so added little to the possibility of operating economies, and a part was for freight cars which only to a limited extent afforded greater possibilities for operating economies. It was in the purchase of heavier and more effective freight locomotives that the Baltimore & Ohio got a part of its increase in operating efficiency. The following is a list compiled from records of the *Railway Age Gazette* showing the type and number of locomotives bought in the years 1910-16, inclusive:

Year	Number	Weight	Type	Builder
1910	203	220,300	Consolidation	A. and B.
	10	260,000	Pacific	B.
	40	270,000	Mogul	B.
	5	457,000	Mallet	B.
	5	460,000	Mallet	A.
	26	214,700	American	B.
1911	10	164,250	Mogul	B.
	10	461,000	Mallet	A. s
	10	271,040	Pacific	B.
	30	277,190	Pacific	B. s
	140	276,056	Mikado	B.
	10	282,200	Mikado	B. s
	10	282,200	Mikado	B. s
1912	50	282,200	Mikado	B. s
	4	120,000	4-Wheel Switcher	B.
1913	10	471,000	Mallet	A. s
	30	248,600	Pacific	B. s
	110	284,500	Mikado	B. s
1914	1	407,060	Santa Fe	B. s b
	30	410,200	Santa Fe	B. s b
1915	15	485,000	Mallet	A. s b
	15	485,900	Mallet	A. s b
1916	50	281,900	Mikado	B. s b
	30	.....	Mallet	B. s b
	10	.....	Pacific	B. s b
	10	178,500	Mogul	L. s b

A, built by American Locomotive Company.  
B, built by Baldwin Locomotive Company.  
s, equipped with superheater.  
b, equipped with brick arch.

The total tractive effort of freight locomotives at the beginning of 1910 was 46,300,000 lb.; the total tractive effort

at the end of 1916 of freight locomotives was 79,189,000 lb. This is an increase of 71 per cent.

In 1910 the Baltimore & Ohio carried 12,024,600,000 ton-miles of revenue freight and total revenue freight train mileage amounted to 27,182,000. In 1916 the road carried 16,199,800,000 revenue ton-miles and the revenue freight train mileage was 21,573,000. In other words, the road is furnishing more than a third as much more transportation for freight in 1916 than in 1910 and is performing this service with a fifth less train mileage.

Here, then, in a nutshell is the explanation of how the Baltimore & Ohio has won through in the struggle to make both ends meet during the period 1910-16. By the purchase of heavier freight locomotives it has placed at the disposal of the operating forces of the road a means of greatly increasing the trainload. By supervision and good management it has made actual the heavier trainloads which the larger engines made possible. The average trainload in 1910 was 442 tons; in 1916, 751 tons.

There appears to be a consistently pursued policy in the relation between President Willard and his staff of officers and between the management and employees. The keynote of this policy appears to be an attempt to lead rather than to drive. In the relations between the management and employees this policy is manifest in the adoption of the Brown system of discipline; in the organization of frequent meetings of various classes of employees under the auspices of the employees themselves for free discussion of grievances and suggestions for improvements, and is typified by President Willard's address to the officers of the Baltimore & Ohio at the annual meeting at Deer Park on June 29, 1917, one sentence from which may well be quoted: "If we could only get all the 60,000 employees of the Baltimore & Ohio to look at this thing in the right way—not necessarily my way, but what seems in our common minds to be the right way—if all can only appreciate how much is involved, and the extent to which the railroads can and must help, the things that the employees of the Baltimore & Ohio alone can do toward creating a better state of mind, a better public opinion behind the government carrying on the war—the good that they can do in that respect would be immeasurable."

There have been examples, especially among the older generation of railroad men, of a road being run very successfully by the driving process. Officers knew that if a bad showing was made the consequence to them would be serious. It was left largely to the officer himself, however, to devise ways and means for making a good showing. An important factor in the results of operation of the Baltimore & Ohio in the years 1910-16 has been the method of supervision adopted over the work of the superintendents.

The general management's supervision over the division superintendent's work aimed at stimulating the superintendent, and through him his officers and the division employees, to the greatest interest and resourcefulness in their work; helping the superintendent analyze his own conditions so as to discover the places where improvement was possible; checking waste before it got fairly started, and providing a means of comparing divisional performance day by day with a standard of what could be done.

The initial step in the adoption of a standard by which to measure wage cost per ton-mile on the Baltimore & Ohio was the keeping of an accurate record of individual train performance over each district. Fig. 1, with the last three columns omitted, shows the form used to keep this record. All of the information on this form is supplied by the train sheets, supplemented in the case of local freight by a special report made by the conductor showing set-outs and pick-ups.

Supplemental to these reports for each division the general officers of the Baltimore & Ohio made in conference with the division officers a first-hand study of the conditions which effected operation over each freight district. Each point of

delay was studied and the causes for the delay at this point analyzed. After a great deal of thought had been given the matter a time card was drawn up for each district showing the time which could be consumed at each point of delay and the necessary speed between these points to insure getting over the district without overtime. These cards were distributed to engine and train crews and to division officers. The time schedules and the tonnage rating of the locomotives in service gave a basis on which to determine ton-mile cost for engine and train crew wages over each district. This cost was then adopted as standard and the actual performance of each train could then be measured in a per cent of standard or perfect operation. In this way the last three columns on Fig. 1 were added. Each division superintendent also was furnished with cards on which he could keep the average record for slow freights for each day on each of the districts under his jurisdiction.

In-so-far as engine crews and train crews are concerned, the standard schedule gives them an object toward which they can work and an incentive and interest in attaining this object which is real and valuable, notwithstanding the fact that it is largely psychological. In-so-far as the superintendent and his officers are concerned, the daily reports of ton-mile costs, with the comparison which they afford with the standard or theoretical minimum costs, give an incentive for the most careful supervision over the performance of each and every train, and furthermore do not tend to diminish the value of initiative and ingenuity in handling traffic. For instance, the standard schedule is based on making no overtime. A given train, however, may make a certain proportion of overtime and because it is hauling a greater tonnage than its rating requires still make a perfect record and a showing of ton-mile cost as low as the standard minimum.

After standards for each division had been established, each superintendent's record was kept on a form similar to that shown in Fig. 2. This has been the basis of the management's supervision over division officers, and it is thought that these records have contributed much to success obtained in economical operation.

The Baltimore & Ohio's outlook for the future is dependent on the general railroad situation. The economies which can be effected by increased trainloading without quite impossible expenditures for grade reduction have apparently about been reached. If increased cost cannot be offset in this way the question arises as to how they can be offset. The limitations of improved supervision and management have pretty surely not been reached; better carloading by shippers is a possibility; but there seems to be a very slight chance that any such great percentage of increased efficiency can be made in the next six and a half years as was made in the period 1910-16. On the other hand, the percentage of increase in costs of operation, due to higher wages and higher costs of materials, are mounting at a far greater rate than they did in the 1910-16 period. The future prospects of the Baltimore & Ohio are, it would appear, largely dependent on the Interstate Commerce Commission.

Although these comments have dealt almost entirely with the comparison between the beginning and end of the period 1910-16, the usual table showing the principal figures for operation in 1916 as compared with 1915 is given in order that uniformity may be preserved with the reviews of this company's annual reports in previous years.

The following table shows the principal figures for operation in the calendar year 1916 as compared with the calendar year 1915:

	1916	1915
Mileage operated .....	4,545	4,533
Freight revenue .....	\$91,891,921	\$79,255,266
Passenger revenue .....	16,169,173	13,982,463
Total operating revenue .....	116,968,882	100,717,666
Maintenance of way and structures .....	14,825,302	10,472,891
Maintenance of equipment .....	23,569,581	18,755,014
Traffic expenses .....	2,113,268	1,908,552

Transportation expenses .....	40,564,932	33,584,941
General Expenses .....	2,624,870	2,359,812
Total operating expenses .....	84,460,293	67,652,602
Taxes .....	4,002,736	3,404,943
Operating income .....	28,465,597	29,633,210
Gross income .....	34,555,277	34,937,607
Net income .....	12,652,675	15,575,410
Dividends .....	9,951,753	9,951,753
Surplus .....	2,611,608	3,664,463

## ST. LOUIS SOUTHWESTERN

GOOD as was the showing which the St. Louis Southwestern made for the calendar year 1916, it was by no means as good as it would have been if the road had not been seriously handicapped by car shortage; nor was it as good as that which will be made in 1917 if present indications are to be trusted. The St. Louis Southwestern is getting back on its feet, but there may be danger that in enthusiasm over the present earnings and prospects for the immediate future, stockholders may lose sight of how much has to be done to entirely rectify a situation which two years ago was rather serious. For the calendar year ended December 31, 1916, the company had \$2,222,000 available for dividends, but the board of directors very wisely, it would appear, did not resume dividends on the preferred, although there is only \$20,000,000 preferred stock.

The process through which the St. Louis Southwestern is now going is one of very thorough physical rehabilitation accompanied by a conservation of financial resources and a really remarkably successful effort to take full advantage of the present period of large railroad gross earnings through operating economies. Although the improvements made in operating methods during the process of rehabilitation and under conditions of extreme car shortage are more interesting to railroad men and are really more unusual than the financial and physical rehabilitation, it is necessary to fully understand the conditions under which the new management is working to appreciate the extent of the success in operation. For some time previous to 1916 the St. Louis Southwestern had not been fully maintained. This was especially true in regard to equipment. Like many other roads, the St. Louis Southwestern found it necessary to cut down appropriations for maintenance, but it was particularly unfortunate in that the expenditures which it did make were not as effective as they ought to have been. The consequence was that when the present great increase in traffic occurred it found the property threadbare in places. Luckily, possibly, the general railroad bond market was such as to preclude the possibility of a road like the St. Louis Southwestern selling a large issue of bonds. Had things gone on as they were apparently going before 1916 and had no large increase in traffic occurred, the road might well have suffered the same fate as so many other southwestern roads. With, however, the advent of a new executive and operating management and a marked change in policy toward maintenance there came also a great increase in earnings, and with this increase in gross a chance to rehabilitate the property, not through the issue of receiver's certificates, but through surplus earnings.

During the six months ended December 31, 1916, \$860,000 was spent for maintenance of way and structures, an increase of \$228,000, or 36 per cent, over the amount spent in same period of 1915, and \$1,360,000 was spent for maintenance of equipment, an increase of \$300,000, or 28 per cent, over same period of 1915; and despite high prices, the expenditures for maintenance, especially of equipment, were far more effective per dollar spent in 1916 than in the year 1915.

The equipment situation was the most serious one which confronted the new management. A program was laid out to cover three years. This called for the rebuilding of 4,650



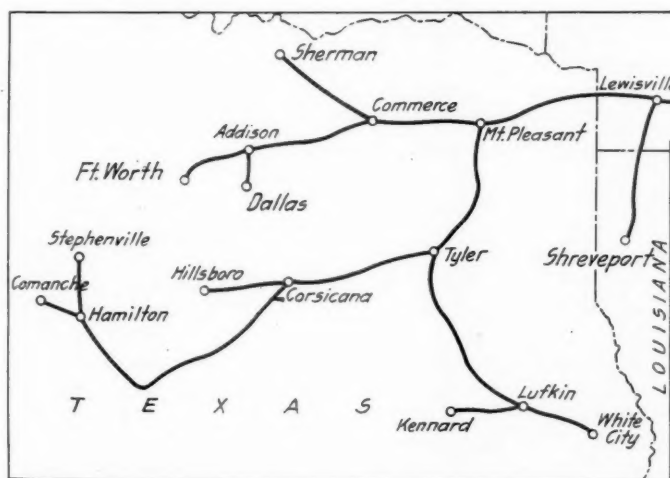
box cars at the rate of 1,550 per year; heavy repairs to 829 other freight cars, and the scrapping or sale of 537 light freight cars of about an average of 20 tons capacity (the total number of box cars in service was about 9,700. This work, which was begun well along in 1916, had up to December 31 progressed remarkably well. Six hundred and sixteen box cars had been almost completely rebuilt and heavy repairs had been made to 343 cars and 71 cars of the light equipment had been scrapped. At the present writing, inquiry develops that, at the close of July, 1917, 1,952 box cars have been rebuilt; heavy repairs have been made to the 829 cars, at an actual cash outlay for labor and new material of \$760,000, all of which has been appropriated from current earnings; and 223 cars of the light equipment have been sold, or dismantled and written out of equipment account. It will thus be seen that their operations, under this general and comprehensive plan of rehabilitation of freight-car equipment, are considerably ahead of the schedule, and will probably be wholly completed and out of the way prior to December 31, 1918, instead of June 30, 1919, as originally contemplated. The company has ordered since the close of the year 125 steel underframe 40-ton box cars to replace 30-ton wooden cars under equipment trusts which have been destroyed. From now on cars will be built at the company's own shops to immediately replace cars destroyed under equipment trusts.

The locomotive situation was not as serious as the car situation, but since the close of the year eight 10-wheel passenger locomotives and 12 Consolidation freight locomotives were bought through the sale of equipment trusts.

Not only was the company's equipment in bad shape, however, but the difficulties of operation were greatly increased by the fact that the St. Louis Southwestern being an originating road felt the car shortage particularly severely. For a period of many months the company did not have on its own lines a supply of cars equal to more than 50 per cent of its ownership of cars.

business handled under conditions which were quite abnormal.

As throwing light on the prospects for the present year it is significant that although there was an actual large increase in freight business moved, much additional business was offered which could not be handled and which will presumably move in 1917. Much of the 1916 crop of cotton was withheld until after December 31. The rice crop of Arkansas was the largest in the history of the state, but a



The St. Louis Southwestern

During the six months ended December 31, 1916, freight revenue amounted to \$5,839,000, an increase of \$1,187,000, or 25.51 per cent. To have moved the large increase in freight business which this increase in revenue represents is no small feat in itself. The increase in revenue was apparently\* greater than the increase in ton mileage, due to the fact that the average ton-mile rate was higher, but not withstanding this there was a very large increase in actual freight

very considerable part of this crop was not moved because of the car shortage, and lumber, which forms an important part of the traffic of the St. Louis Southwestern, while showing a largely increased tonnage moved partly because of better carloading, did not move in by any means the volume that it would have had more cars been available.

Transportation expenses (the out-of-pocket cost of moving the business) amounted to \$2,105,000, an increase of \$287,000, or 15.81 per cent, over the previous year. The average carload of freight in the last six months of 1916 was 18.30 tons, comparing with 17.95 tons in the fiscal year ended June 30, 1916, and 17.55 tons in the fiscal year ended June 30, 1915. The average trainload, including company freight, was 394 tons in the six months ended December 31, 1916, comparing with 386 tons in the fiscal year ended June 30, 1916, and 345 tons in the fiscal year ended June 30, 1915. Better carloading and better trainloading were the methods used in holding down transportation expenses so successfully in the face of the very adverse operating conditions above described. It is quite safe to say that the better trainloading was largely due to a renewal of enthusiasm on the part of officers and employees brought about by more direct and personal supervision on the part of the new vice-president in charge of the property.

The improvement in the financial condition of the com-

\*Traffic statistics are not given in the company's annual report for the calendar years 1916 and 1915, comparisons being made only for the six months ended December 31, 1916, and the corresponding six months of 1915. The average ton-mile rate in the 1916 six months was 1.15 cents, and in the 1915 six months, 1.05. The increase in the 1916 six months over the corresponding period of the previous year in tons of freight carried one mile was 14.75 per cent.

pany is striking. At the end of the June 30, 1916, fiscal year there were \$785,000 loans and bills payable; at the end of the calendar year 1916 this entire amount has been paid off. Cash on hand had been increased by \$679,000, bringing the total up to \$1,299,000, and special deposits had been increased by \$535,000, bringing the total up to \$979,000. The working capital of the St. Louis Southwestern would be quite ample for a 1,754-mile road doing the amount of business that this road does under ordinary circumstances, but with the program laid out for rehabilitation through surplus earnings this working capital is certainly not large enough to justify any disbursement in the way of dividends.

The St. Louis Southwestern will undoubtedly need, some time in the comparatively near future, considerable expenditures for additions and betterments. In the last six months of the calendar year 1916 there was \$142,000 spent for additions and betterments, of which \$133,000 was appropriated from the income of that six months. As soon as railroad credit improves and the full results of the present operating methods and policy toward rehabilitation have become effective the St. Louis Southwestern ought to have an ample basis on which to do necessary financing. The company has spent \$517,000 on road equipment, against which no securities have been issued; it has \$1,111,000 bonds of affiliated companies which are not pledged, and has made construction advances amounting to \$268,000, besides having loaned the Valley Terminal Railway \$261,000 and has in its treasury \$4,114,000 of its own first terminal and unified mortgage bonds. The Valley Terminal Railway mentioned above is a subsidiary company formed to build a large interchange yard near East St. Louis. In all about 14 miles of track will be laid in this yard and when completed this yard will connect the Missouri Pacific-St. Louis Southwestern joint Illinois main line and the Terminal Railroad Association of St. Louis with the Alton & Southern and the Illinois Central.

The following table shows the operating figures for the six months ended December 31, 1916, and December 31, 1915:

	1916	1915
Average mileage operated.....	1,754	1,754
Freight revenue .....	\$5,838,628	\$4,651,869
Passenger revenue .....	1,594,466	1,222,176
Total operating revenue.....	7,906,460	6,280,779
Maintenance of way and structures.....	858,986	631,281
Maintenance of equipment.....	1,360,267	1,060,046
Traffic expenses .....	269,079	242,842
Transportation expenses .....	2,104,831	1,817,421
General expenses .....	273,295	257,466
Total operating expenses.....	4,884,094	3,972,574
Taxes .....	306,615	289,877
Operating income .....	2,714,428	2,016,048

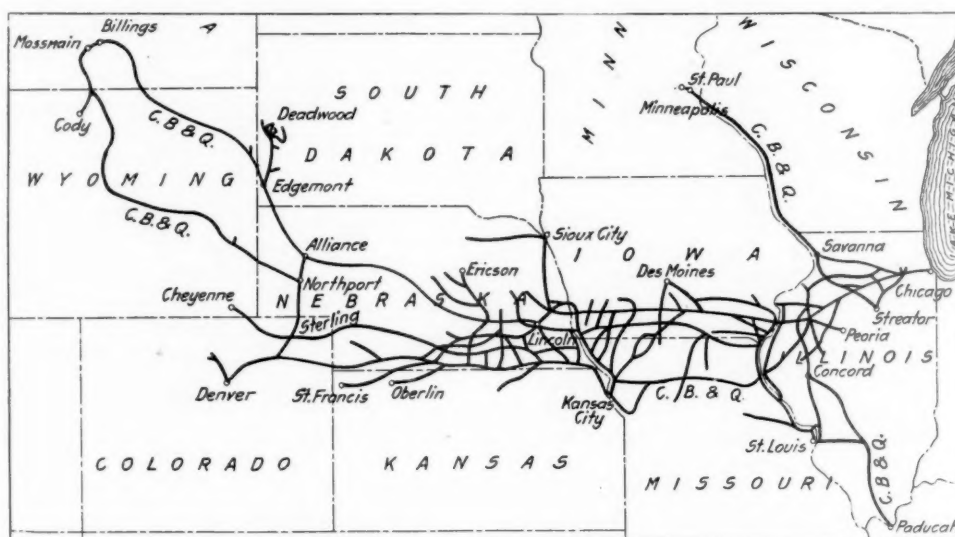
The following table shows the income account figures for the calendar year 1916 compared with the calendar year 1915:

	1916	1915
Operating revenues .....	\$13,850,130	\$11,275,024
Operating expenses .....	9,318,306	7,848,791
Taxes .....	615,814	598,793
Operating income .....	3,913,634	2,823,982
Gross income .....	5,442,631	3,951,776
Net income .....	2,222,165	736,012
Appropriated for additions and betterments.....	132,580	.....
Surplus .....	2,089,585	736,012

## CHICAGO, BURLINGTON & QUINCY

THE Burlington has reduced its operating ratio to below 60 per cent. The ease with which this road, its management and its organization have handled a very great increase in business in the last year and a half is in striking contrast to the difficulties which the eastern trunk lines have experienced in taking care of their increased business. For one thing it illustrates graphically the contrast between a railroad plant with a large margin between business handled and capacity of facilities and a railroad plant being worked under normal conditions to within 10 or 15 per cent of its capacity. In the case of the Burlington, however, not only does the showing made in the calendar year ended December 31, 1916, give a basis for generalizations about railroad operation, but it also brings home with great force the remarkable foresight and combination of precision of judgment and imagination which has been exercised in the development of these 9,019 miles of railroad.

For the first time the Burlington earned over a hundred million dollars—\$109,191,000 in the calendar year 1916.



The Chicago, Burlington & Quincy

The average ton-mile rate was lower in 1916 than in 1915, being 7.08 mills last year and 7.21 mills the year before. The ratio of expenses to total revenues was 59.74 in 1916, as against 64.25 in 1915. The ratio of transportation expenses to total operating revenues in 1916 was 29.32; in 1915, 30.57.

After paying expenses, rentals and interest the Chicago, Burlington & Quincy had a surplus available for dividends of \$32,995,000, comparing with a surplus in 1915 of \$21,672,000. The 1916 surplus was equivalent to nearly 30 per cent on its stock. The Burlington has been for a number of years paying regular dividends of 8 per cent. During this last week the directors have declared in addition to the regular quarterly dividend an extra dividend of 10 per cent. Certainly this is amply justified by the showing made in the calendar year 1916. This extra dividend which the Burlington declared goes in equal parts to the Great Northern and the Northern Pacific, and unless an extra dividend is declared by one or both of these companies, is not in the nature of an extra cash distribution to investors.

Heavier trainloading was by far the most important item in the explanation of the Burlington's lower transportation ratio. The increased volume of traffic and the better balancing of traffic were important factors in helping the increase in trainload, but this fact detracts not at all from the credit which is due to the organization which, under



stress of an increase of 19 per cent. in the revenue freight carried and of 22.7 per cent. in ton mileage of revenue freight, held freight train mileage down to an increase of only 11.7 per cent. and freight train car mileage down to an increase of 10.8 per cent. The average revenue trainload on the Burlington in 1916 was 575 tons as against the average in 1915 of 519 tons, and the average trainload of all freight, including company, was 670 tons in 1916 and 617 tons in 1915. With a road operating 9,019 miles, of which more than half is branches and spurs, and having as large a proportion of grain and livestock as the Burlington and as small a proportion of coal—only 30 per cent. of the total tonnage even in 1916—a trainload of 670 tons is a record that the management may well be proud of.

The average number of loaded cars in freight trains, excluding mixed trains, in 1916 was 28.89, as against 27.75 in 1915, and of empty cars, 11.64 as against 13.14 the year before. The average tonnage of all freight per loaded car in 1916 was 23.94, and in 1915, 23.09. With a small proportion of coal tonnage this is remarkably good carloading.

The outstanding reasons for the Burlington's present great prosperity are its original comparatively low cost of building, its low capitalization per mile of road, the policy of keeping the road well ahead of the needs of a rapidly growing country by the expenditure of large sums from surplus earnings for additions and betterments, and the perfecting of an operating organization which, like the plant itself, has been kept far enough ahead of the requirements placed on it to be capable of meeting even an overload such as has developed in the last year and a half without breaking down under it.

When we talk about the Burlington's surplus and its great investment from earnings in additions and betterments it is essential to remember that during all these years the Burlington has been in active competition throughout its territory with other powerful railroads, and of necessity its rates have been no higher than those of other roads and its service has had to be at least equal to that of its competitors. There can be, therefore, no question of the company having charged unduly high rates to build up its great surplus. Its rates were reasonable, both as established by the test of competition and by court and state commission reviews. The huge surplus which has been put into the property represents the self denial of the owners of the stock of the company in not taking profits which under any test belong to them. The total surplus at the end of 1916 amounted to \$203,090,000 and is divided on the company's balance sheet as follows: \$40,527,000 additions to property since June 30, 1907; \$15,437,000 funded debt retired through income; \$24,080,000 sinking fund reserves; \$8,565,000 appropriated surplus not specifically invested (possibly some of this amount was drawn upon for the extra 10 per cent dividend), and \$114,481,547 profit and loss. The Burlington's cash on hand at the end of 1916 was nearly double its total current liabilities—cash amounting to \$19,848,000 and current liabilities to \$11,422,000. In addition to the cash on hand there was \$12,347,000 time deposits.

In 1916 the Burlington appropriated from income \$8,865,000, but this covered the 18 months ended December 31, 1916. The actual additional investment in road and equipment during the calendar year 1916 was \$8,616,000. The principal items of expenditure were \$1,125,000 for grading, \$1,064,000 for bridges and trestles, \$912,000 for shops and engine houses, \$417,000 for freight cars, and \$445,000 for passenger cars.

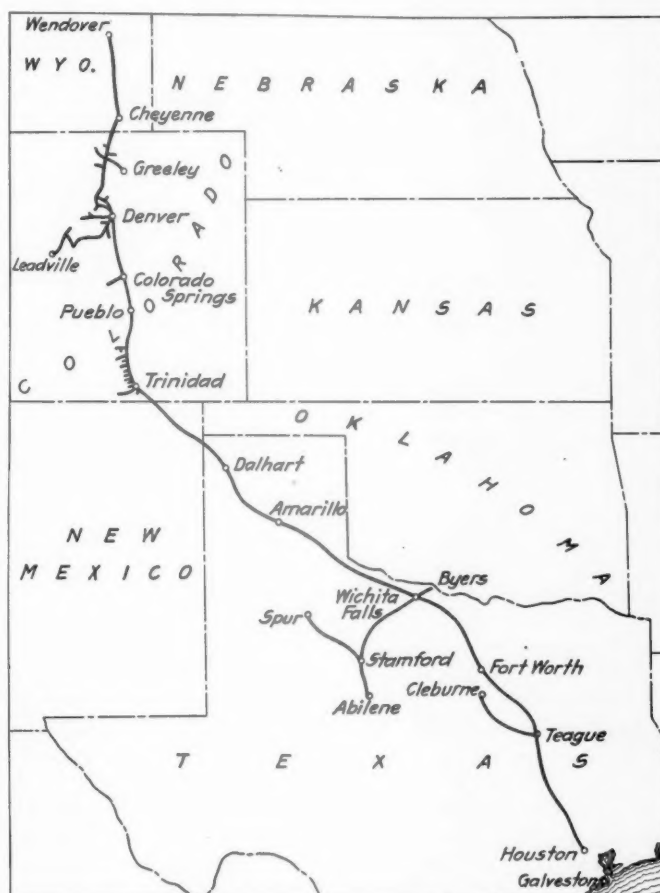
The following table shows the principal figures for operation in the calendar year 1916, compared with the calendar year 1915:

	1916	1915
Mileage operated .....	9,019	9,019
Freight revenue .....	\$77,310,516	\$64,211,845
Passenger revenue .....	21,833,534	20,838,622
Total operating revenues .....	109,191,204	93,589,722

Maintenance of way and structures .....	12,203,997	12,025,216
Maintenance of equipment .....	17,053,852	14,833,787
Traffic expenses .....	1,662,805	1,577,138
Transportation expenses .....	32,014,949	28,810,984
General expenses .....	2,203,308	2,033,345
Total operating expenses .....	65,235,705	60,127,079
Taxes .....	4,820,197	4,262,552
Operating income .....	39,098,988	29,175,934
Gross income .....	42,090,304	30,480,802
Net income .....	32,994,726	21,671,892
Sinking funds .....	1,864,287	1,783,800
Dividends .....	8,867,128	8,867,128
Additions and betterments .....	8,864,595	3,340,669
Fund for accrued taxes not yet due .....	2,400,000	.....
Miscellaneous appropriations .....	6,000,000	.....
Surplus to profit and loss .....	4,998,715	7,680,295

## COLORADO & SOUTHERN

IT is interesting to note how the policies of the parent company, the Chicago, Burlington & Quincy—are being reflected in the showing made from year to year by its subsidiary, the Colorado & Southern. The Chicago, Burlington & Quincy bought the controlling interest in the Colorado & Southern in 1909. The road had been previously placed on a dividend paying basis—apparently a 4 per cent basis—for its preferred stock, of which there is \$17,000,000 out-



The Colorado & Southern

standing, but not long after the Burlington took possession, dividends were discontinued, and it was not until October, 1916, that they were resumed. In the calendar year 1916 the Colorado & Southern had available for dividends \$3,011,000, and payments for the year, representing a 2 per cent dividend on the preferred payable October 10, 1916, amounted to \$170,000.

The Colorado & Southern is one of those lines which may have to profit by traffic developed via the Panama Canal, but in 1916 practically none of this traffic was developed, and the very favorable showing made by the Colorado &

Southern as compared with its showing in 1915 was due entirely to the general prosperity of the territory served and increase in coal consumption and shipments of agricultural products. In 1916 the total ton mileage of revenue freight was 1,221,500,000, an increase as compared with 1915 of 143,800,000 ton-miles. Total freight revenue amounted to \$11,951,000, an increase of \$1,390,000 over 1915, and passenger revenue amounted to \$3,523,000, an increase of \$262,000 over the previous year.

The Colorado & Southern is a single track road connecting Colorado with the Gulf, using the Trinity & Brazos Valley as an outlet to Houston, Tex. With freight revenue in 1916 of \$6,489 per mile and passenger train revenue, including express, mail, etc., of \$2,174 per mile, the average ton-mile rate was 9.78 mills, a decrease of 0.02 mills as compared with 1915, and the revenue per passenger-mile was 2.626 cents in 1916, an increase of 0.057 cents.

Of the total tonnage amounting in 1916 to 7,873,000, 62.44 per cent originated on the Colorado & Southern lines and 37.56 per cent was received from connecting carriers. Of the total tonnage, 55.78 per cent was products of mines, 19.16 per cent products of agriculture and 11.40 per cent manufactures. L.c.l., although furnishing only 2.85 per cent of the total tonnage, furnishes 11.39 per cent of the total freight revenue, and fruits and vegetables, which are included in the tonnage of products of agriculture and which represent only 1.62 per cent of the tonnage of all freight, furnished 4.65 per cent of the total freight revenue.

In 1916 the Colorado & Southern brought its operating ratio down from 68.30 to 61.24. Total operating expenses amounted to \$10,085,000 in 1916 as against a total of \$10,071,000 in 1915. Transportation expenses show up particularly well. These expenses amounted to \$4,611,000 in 1916, with 1,221,500,000 ton-miles of revenue freight carried and 134,150,000 passenger-miles handled, and in 1915 to \$4,604,000, with 1,077,800,000 ton-miles of revenue freight and 126,900,000 passenger-miles. Notwithstanding the larger freight business handled, total freight train mileage amounted to 2,856,000 in 1916 as against 2,914,000 in 1915. Passenger train mileage increased slightly, being 2,437,000 in 1916 and 2,404,000 in 1915.

Maintenance of way expenses were held down probably because of the difficulty of getting material and men. They amounted in 1916 to \$1,882,000 as against \$1,944,000 in 1915. The two principal items in which there was a saving were ties, with \$442,000 spent in 1916 and \$494,000 in 1915, and track lying and surfacing, with \$537,000 spent in 1916 and \$595,000 spent in 1915.

Maintenance of equipment costs increased only very slightly, amounting in 1916 to \$2,821,000, and in 1915 to \$2,769,000. The decrease in the cost of repairs of freight cars is little more than offset by an increase in the amount charged for depreciation of freight cars, and there were also small increases in the amounts charged for depreciation of passenger cars and of locomotives.

Burlington policies are in evidence in the 1916 balance sheet of the Colorado & Southern. Cash on hand amounted at the end of the year to \$2,682,000, and time drafts and deposits to \$2,970,000. There were no loans and bills payable, and total current liabilities amounted only to \$2,489,000. There was to the credit of profit and loss June 30, 1908, just prior to the purchase of the Colorado & Southern by the Burlington \$6,539,000. At the end of 1916 there was a total corporate surplus of \$13,652,000, and in the intervening years considerable amounts had been written off through profit and loss.

The following table shows the principal figures for operation in the calendar year 1916 compared with the calendar year 1915:

	1916	1915
Average mileage operated .....	1,842	1,829
Freight revenue .....	\$11,951,001	\$10,560,926
Passenger revenue .....	3,522,955	3,260,469

Total operating revenues .....	16,469,279	14,746,665
Maintenance of way and structures .....	1,881,738	1,944,311
Maintenance of equipment .....	2,821,367	2,769,214
Traffic expenses .....	213,672	202,160
Transportation expenses .....	4,611,103	4,604,377
General expenses .....	479,700	475,085
Total operating expenses .....	10,085,332	10,071,277
Taxes .....	757,611	666,184
Operating income .....	5,625,619	4,007,906
Gross income .....	6,347,780	4,575,976
Net income .....	3,011,227	1,108,150
Sinking funds .....	67,432	68,301
Dividends .....	170,000	.....
Additions and betterments .....	280,220	.....
Miscellaneous appropriations .....	500,000	.....
Surplus .....	1,992,575	1,039,848

### BROOKLYN RAPID TRANSIT

THE Brooklyn Rapid Transit earned its 6 per cent dividend in the fiscal year ended June 30, 1917, with only a comparatively small margin to spare; but, on the other hand, the company made a better showing in the second half of the year than in the first half. This is especially encouraging in view of the fact that prices of materials and labor have continued to rise, being considerably higher in the second half of the fiscal year than in the first half. There are two sources from which the Brooklyn Rapid Transit may expect to show increased gross and a corresponding increase in amount available for dividends. One is from its operation of rapid transit lines, in the earnings of which it has a prior joint interest with New York City, and the other from an operation of its surface lines.

The one hope of increased net available for dividends from the surface lines is that the New York Public Service Commission and public opinion generally will recognize the necessity for the maintenance of the credit of the company and grant its requests for a small charge for transfers. The increase in cost of doing business on the surface lines is, in-so-far as it affects materials, probably not permanent, but in-so-far as it affects labor—and a large part of the increase in the cost of operation of the surface lines was in increased wages—it will in all likelihood be permanent.

The transfer privilege in large cities is very much abused, and especially is this so in Brooklyn and in New York. The Brooklyn Rapid Transit in 1913 received an average of 3.41 cents per passenger per ride. This has been steadily decreasing, until in 1917 it was only 3.26 cents. While there may be a great deal of force in the argument that a nickel fare has been established so long and is so much more convenient than a six-cent fare that it will be almost impossible to get municipal governments and public service commissions to agree to change from this fare, these arguments do not apply to a charge for transfers. A charge is now made in New York for a transfer from the subway to surface lines and there is no complaint of inconvenience. The unscrupulous man or woman who gets a transfer, does a morning's shopping and then uses the transfer is getting a service which amounts to discrimination against the more scrupulous passenger who pays a second fare in accordance with the provisions on the face of the transfer.

As will be shown later, there is no prospect of an immediate increase in net revenue to the Brooklyn Rapid Transit from the operation of its rapid transit lines in partnership with the city, although in years to come the operation of this part of the system may prove very profitable. The company, however, needs a greater margin of safety above dividend requirements and needs it immediately.

The company spent for additions and improvements to its surface lines, exclusive of any construction expenditures under contract made with the city, \$1,249,000. As far as the balance sheet is concerned this expenditure was in part offset by a credit of \$957,000 for properties displaced, the largest single item being a credit for power plants abandoned or sold. The company spent on capital account, therefore, in



1917 about \$1,225,000, part of which should have been and was supplied from surplus and the rest will have to be, some time in the future supplied from the sale of securities. The company is now carrying a floating debt of \$4,450,000 secured by refunding bonds. It is obvious that this debt ought to be funded in the near future.

The people of Brooklyn are vitally interested in the proper maintenance and expansion of the Brooklyn Rapid Transit. The company in recent years has given indisputable evidences of good faith in its efforts to build up an organization which will give good service to its patrons. Good service on a city railway depends primarily on two things: type of equipment and caliber of conductors and trainmen. The Brooklyn Rapid Transit is adopting, as near as can be judged, modern types of equipment just as rapidly as its financial condition will permit. Operating conditions in Brooklyn are such as to preclude certain types of equipment that smaller and less congested cities are using.

A motorman or conductor's job, especially in winter, is a hard one. If low wages are paid and poor conditions of work are tolerated the class of men that will take such jobs are a very poor type and the average time which a man holds down his job is short. Recognizing this, the Brooklyn Rapid Transit has made special efforts to pay as fair a wage as operating revenues will permit and at the same time to create conditions which will attract a higher grade of men than would ordinarily become street railway conductors or motormen.

In commenting on the company's previous reports mention has been made of the employees' welfare work, which includes various activities in the interest of the health and social entertainment of employees and the company also provides life insurance for employees. The Brooklyn Rapid Transit spent \$133,000 on this work in 1917 and it is interesting to note that there are now 6,246 employees who are members of the group insurance plan. At Christmas the company gave its employees in the form of gratuities a little over \$29,000. The company also helped its employees to subscribe to the Liberty Loan, making it possible for them to make small monthly payments to be deducted from wages, and the total number of employees subscribing for Liberty bonds was 7,744, the amount subscribed for being \$579,000. It was, of course, necessary for the company to borrow the amount necessary to finance its employees' subscriptions and employees were allowed in some cases as much as two years to complete their payments.

In-so-far as the employees themselves are concerned, they showed an appreciation of what the company is doing for them by a refusal to join in with the outside agitators who created considerable trouble in Manhattan last winter. President Williams says that the sympathetic relations which have prevailed for years between men and management remained unbroken. Not only are the employees deriving benefit from this broad policy of the company, but the patrons also ought to appreciate that these efforts are of direct and vital interest to them. It is difficult enough to train even fairly high class men to give courteous, good service in surface street car work. It has been proved over and over again quite impossible to train a poor grade of men to perform this work at all efficiently. The conditions in rush hours on the Brooklyn Rapid Transit, as on other street railways in the large cities, can be bettered only through the provision of additional facilities, but conditions in non-rush hours vary directly with the efficiency of motormen and conductors. While the Brooklyn Rapid Transit has by no means reached its ideal in the training of its employees, the public and Public Service Commission both ought to recognize the farsightedness of the efforts which are being made in that direction and to co-operate with the company so as to permit the establishment of a credit which will insure adequate development of facilities and a continuation of payment of fair wages

and the provision of good working conditions for employees.

As was previously mentioned, the prospects for immediate increased net from the operation of the rapid transit lines in which the city has a partnership are not at all good. The Brooklyn Rapid Transit under the agreement made with the city in 1913 has spent \$11,149,000 toward the building of new city owned lines, \$8,373,000 for equipment of city owned lines, and \$30,459,000 for additions, extensions and improvements on existing lines; a total of \$49,981,000. The agreement with the city provides for a first preferential for the company of \$3,500,000 and a further preferential for interest on additional expenditures for equipment, new city owned lines, etc. Previous to June 30, 1917, fiscal year the earnings on the rapid transit lines had failed, after the payment of maintenance, taxes, depreciation, etc., to quite cover the total \$10,180,000 company's first preferential from August 4, 1913, to June 30, 1916. During the year ended June 30, 1917, however, earnings provided for the payment of \$3,500,000 first preferential due in that year in full, with a net of \$858,000 over. The amount due on the second preferential was \$1,109,000, so that there was a deficit of approximately \$250,000 in the company's preferential. This deficit is cumulative and the total amount now owing to the company out of future net earnings is \$1,037,000. As new lines are put into operation there is a very good prospect that the company will be able not only to earn its first and second preferentials but to earn enough to take up this deficit; but after the deficit has been taken up no further profits will accrue to the company except its preferentials until the interest paid by the city on its cost of construction is earned in full.

The city's deficit in the year ended June 30, 1917, was \$2,239,000, and presumably it will be some little time before net earnings are sufficient to pay both the company's preferentials and the city's interest charges. What the company needs, therefore, is to have the Public Service Commission grant it sufficiently increased revenues on the surface lines to strengthen its credit and make safe its dividend during the period which must elapse before a larger profit is earned on the new rapid transit lines.

The following table shows something of the magnitude of the business done by the Brooklyn Rapid Transit:

Fiscal Year Ended June 30, 1917.	
Total miles of first track of surface lines.....	129
Total miles of second track of surface lines.....	124
Miles of first track of surface lines leased.....	116
Miles of second track of surface lines leased.....	111
Total miles (all double track) of rapid transit lines.....	57
Grand total miles of all tracks (surface and rapid transit) leased and owned.....	743
Passenger earnings, surface lines.....	\$17,154,827
Passenger earnings, rapid transit lines.....	11,331,000
Total earnings, including mail and freight.....	29,931,833
Operating charges and betterments.....	16,741,417
Taxes .....	2,351,104
Interest and rentals.....	5,644,074
Net available for dividends.....	5,195,238
Dividends .....	4,467,318
Surplus (after deducting other appropriations).....	382,016
Passengers carried .....	760,519,397

## NEW BOOKS

*Eight-Hour Law Time-Mileage Computing Table.* Copyright by C. F. Needham. Published by Fred. E. Murray, Battle Creek, Mich. Printed on celluloid card, in two colors. Vest pocket size 2¼ in. by 3¼ in., price 50 cents; and office size 4¾ in. by 7¾ in., price \$1.

This table is designed for the purpose of reading at a glance the number of miles corresponding to any given period of time, in hours and minutes, from 1 minute to 24 hours; and conversely the time, in hours and minutes, corresponding to any given number of miles from 1 to 300 miles, at 12½ miles per hour. The small size is convenient for men in engine and train service; while the large size is for the use of timekeepers and others, or for posting on terminal bulletin boards.

# How Railway Efficiency Helps Win the War.

Why Better Use of Existing Facilities May Save the  
Lives of Hundreds of Thousands of Young Americans

By Daniel Willard

President, Baltimore & Ohio, Chairman Advisory Commission on National Defense.

ON the 6th of last April this country, by formal action of Congress, became a participant in the greatest war that has ever occurred in the history of mankind. Before the United States entered the war we were told on good authority that there were at that time 37,000,000 men in uniform and under arms on the various battlefields of Europe—not in the first line, it is true, but either at the front or in reserve—37,000,000 men in uniform and under arms before the United States went in! Estimates have been made which would indicate that at the present time the cost of this war to the total participants is approximately \$100,000,000 a day in money and 15,000 men in lives lost—not crippled or wounded, but lives actually lost every twenty-four hours. But terrible as that is, it is only a mild statement of the case. It is just the slightest possible measure of what is being done. That statement takes no note of property destroyed, of those crippled for life, of minds shattered, of eyesight lost.

The United States for a long time, longer than some thought should have been the case, kept out of the war. I tried, with many others, to be neutral. I had been in Germany many times. I had great admiration for the German people. I have a great admiration for the German people today. But developments took place, things happened (all of which were laid before you by the President in his various admirable messages, and all may know, if they desire to know, why it is that we are at war), and the day when our Congress decided that we should enter the war, no matter what might have been my previous views, that day I ceased to be a neutral. I am not a Democrat. I did not vote for President Wilson; but this is not a matter of politics, it is a question of national existence; and today a man can occupy only one of two possible positions on that question; he is either for his country or he is against it. There is no other possible choice.

One of the first problems requiring serious consideration after the declaration of war was the matter of transportation, and I feel that it is a great credit to the railroads of this country that in just five days after the Congress had declared war, men representing the 175 principal independent railroad companies in the United States assembled in Washington, and, after listening to a presentation of the situation, they voted unanimously then and there, and signed papers confirming their action before they left the city, giving to a small committee of five men, selected by these railroad representatives, full power to control the operation of all the railroads in the United States during the period of the war in order that the railroads might thereby be in a position to respond immediately and as a unit to any demand made upon them by the President in the interest of the general situation.

Nothing of the kind was ever done before by any industry, so far as I know, in this or any other country, and the railroads were the first to do it—and remember, only five days after war was declared. We went from a system of 175 separate and independent companies competing with each other into one nationalized system under the control of five of the ablest railway men in the country. Why? In order that we might best serve our country and so best help to win

the war. That is why it was done. No other reason in the world would have induced those executives to turn over their properties to be run as five men might dictate.

The committee of five men are sitting constantly in Washington, in effect with a map of the United States before them, on which is a railroad system 265,000 miles in length, with all ownership names wiped out. They are no longer thinking in terms of C. B. & Q., North Western, Pennsylvania, or anything of that kind. They realize that they are faced with the problem of seeing that the necessary transportation service of the United States is performed. They find, for instance, that unless unusual efforts are made to move coal to the Northwest there is likely to be a coal famine there next Winter, and, so far as they are able to prevent it, there will be no coal famine in the Northwest next Winter. Early in the Spring it became apparent that this nation would be expected to furnish much of the food stuffs required by our Allies, and with that in mind the Secretary of Agriculture urged the farmers all over the country to enlarge their crop areas as much as possible. In response to that request it is estimated that the amount of tilled land, the acreage plowed up this year, is at least 30 per cent greater than it was a year ago.

Now, in order that the program might be a success, that we might have more crops, that this additional tilled land might be productive, it was necessary to move quickly and in the Spring, not at some other time, the things necessary to increase the crop growth, such as seeds, fertilizers and agricultural machinery. That was one problem, I repeat, and the railroads met it, and I have heard no complaint from the Secretary of Agriculture or from any other source that the crop acreage or condition has been restricted or impaired in the slightest degree by the failure of the railroads to furnish proper transportation.

The importance of the railroads in a time of war is constantly illustrated. Marshal Joffre, when he was in Washington a short time ago, said something like this, as near as I can recall:—"The Battle of the Marne was won by the railroads. Without the railroads it would never have been possible to bring up the supplies, to provide the armies with the munitions, and all the things necessary to carry on the battle. The railroads won the Battle of the Marne." That was the statement made by the Hero of the Marne, one of the greatest soldiers of the present day.

## RAILWAY SITUATION IN RUSSIA

Professor Lomonosoff, a high official of the Russian transportation system, is in this country now. A few days ago he also made the statement that unless they can have improved transportation facilities in Russia, it will be impossible for them to vigorously carry on the war. I am going to take time to tell you briefly just what he said about the railroad situation in Russia.

He pointed out for instance, that Petrograd—which is, we will say, the Pittsburgh of Russia—had formerly obtained its coal supply from England. Of course, they use a great deal of wood also in Russia, but at the same time they require a great deal of coal. Owing to the conditions on the ocean, the menace of the submarine and the shortage of boats, Petrograd is unable longer to get coal by ships via Archangel, on the North Sea, as was formerly the case; the same condition obtains at Moscow. Other interests are also af-

\* From an address delivered to the officers of the Baltimore & Ohio at Deer Park, Md., June 29, 1917.



fected by the reduced coal supply from the North. Russia is not so richly favored by Nature with coal deposits as is the United States, and the only deposit of any considerable size is in Southern Russia near the Caucasus, 1,400 miles from Petrograd. They are now obliged, because of that situation, to haul roundly 1,500 cars of coal north from the Caucasus each day, several times more than they had to haul in times of peace. That, in itself, was a pretty big transportation problem in a country so sparsely provided with railroads as Russia.

Furthermore, the blocking of the Archangel route virtually made Vladivostok the front door of Russia, and where formerly equipment and other things much needed came in by a much shorter haul, now those same materials, if they get there at all, must come via Vladivostok and be hauled by rail 6,000 miles before they reach Petrograd. Some of that railroad—considerable of it, in fact—is single track. I want you to know this because you gentlemen have got to play an important part in the winning of this war. I hope



From the St. Louis Globe-Democrat

#### Russia: Well, Now You Know What I Need

I will succeed in making that clear to everyone of you. I have no doubt that you have appreciated it from the first, but it will do no harm to repeat, that every man in this room has got to *help win this war*. Today Russia wants 2,500 locomotives just as soon as they can be obtained and 40,000 cars. Why should we be interested in that? For this reason, for this very, very good reason. It is estimated that the Germans have some two and a half millions of their troops on the Eastern front. If Russia should be forced to make a separate peace with Germany, and she might be compelled to do so—not because of the change of government, because it is believed that that change has helped the situation—but suppose Russia should be unable to get supplies, to get food, to get ammunition, to get guns, and all the other things necessary for her army—she might have to quit whether she wanted to or not, and if Russia should make a separate peace with Germany those two and one-half million Germans that are now facing the Russian Army would be released and would be moved to the western front facing France and England, and that is the exact number, I suppose, of additional men which we would have to send over to oppose

them. In other words, it may mean two million more of our young men to France if Russia is unable to meet her transportation problem satisfactorily.

It is because of the seriousness of that situation that it was felt, as soon as we got into the war, that one of the most important things to do was to find what, if anything, we ought to do to help in that connection. Fortunately, Major Washburn, who had been in Russia all during the war as correspondent for the London Times, happened to be in this country and he appeared before the Council of National Defense and explained the situation—told how important it was that Russia's railroad facilities be quickly improved so that she could carry on her operations. It was immediately decided to send a small committee of our best railroad men to Russia to find out what the situation was, and how we could be of assistance.

It took some three or four weeks to arrange the preliminaries for sending such a committee, because things were just then somewhat disturbed in Russia. A country cannot throw off an old government and take on a new one quite as easily as you can change your coat. It is a very serious undertaking, and we ought all to be glad that so far it has been carried on with such success that it promises to go through to a satisfactory conclusion. However, the committee was appointed, and comprises five of the best men who could be sent on a mission of that kind. John F. Stevens, chief engineer of the Panama Canal in its early stages, was made chairman of the Commission.

The Canadian Pacific Railroad, at our request, held the "Empress of Asia," one of their largest steamships, four days at Vancouver for the committee—they being unable to reach there sooner. They were met with a special train at Vladivostok, and taken through to Petrograd. The burden of all letters and cables that we get from them is "send cars and engines without limit; we must have cars and engines quickly, and we must also arrange to erect the cars and engines ourselves." Heretofore, because of there being no shops at Vladivostok, the engines have been hauled 400 miles to Harbin to be set up in the shops at that place. They have now asked us to erect them at Vladivostok, and that also we are going to do.

#### "BE CAREFUL OF YOUR POWER"

Now, why do I mention all this? For this reason: the combined output of the locomotive shops in this country is about 5,500 a year. Russia wants a thousand engines before the first of January, and at least 2,000 next year. England and France require from 1,000 up to as many as we can give each year. But suppose we give Russia 1,500 next year and England and France 1,000? That is nearly one-half of the average total locomotive output of this country. We also need more power on our railroads, but shall we sit down and hold on to everything we have and see Russia forced to a separate peace? Shall we, in order to make our own task somewhat easier, to meet a situation that is undoubtedly pressing here, hold on to all the new engines we can build, facing the possibility that because of such action we may have to send 2,000,000 more of our young men to the battle line? Or shall we say to the builders, "You send the engines that Russia wants, you send the engines that France and England want, and we by additional effort will undertake to carry the greatly increased burden put upon us, with what we already have"; that is why I ask you to be more careful of your power, to keep it in better shape, to get more out of it, to try constantly to do more with what you have. Not because we do not want to spend money, although that is a good reason, but because we want to send every available car and engine to our Allies so that on that account we will be called on to send fewer of our young men. I want you to think of that seriously. The railroad committee in Washington, which sits there constantly, is en-

deavoring to deal with the situation in such a way as to contribute most toward the winning of the war.

#### THE RAILROADS' PROBLEM

The railroads will not be able, no matter how hard they try, to carry all the freight that will be thrown upon them during the war, and this is why: They were measurably well equipped to perform the service of the country before the war began. As a matter of fact, for a period of some seven or eight years there was nearly always a surplus of anywhere from 50,000 to 350,000 freight cars. It cannot be said that the railroads were not fairly equipped to do the work required of them when the war began. Since then, and particularly within the last six months, we have done what I have already pointed out toward increasing the crop average. Our shops and factories were working feverishly day and night before we entered the war, making munitions for our Allies. Since then this government has appropriated two billions of dollars for the necessary supplies for its own army, superimposed on what we were already undertaking to do.

In addition to that, many boats on the Lakes which formerly carried a large volume of business east and west have been taken off, sent down through the Welland Canal and are now in Trans-Atlantic service. The boats that formerly ran up and down the Pacific Coast, carrying coal from Vancouver to southern points, have been taken off to be used as mine-sweepers, patrols and in transport service for the Navy. In the east a considerable number of boats that formerly were in our Atlantic coastwise service have been taken off. The business they formerly carried is now being done by the railroads. Not only have boats been taken off, but insurance rates on the water are so high, because of the submarine menace, that much of the business that might go by boats is now going by the railroads, and still further, the boats that formerly ran through the Panama Canal are now in other service. All that puts additional work upon the railroads, and that they have responded to the situation as well as they have I think is a great credit to everyone engaged in the railroad calling. Now, for the reasons given, the railroads will not be able to carry all the freight that may be offered. That is one of the things that I wish you gentlemen to understand, so that you will be able to help the public understand—that part of the public with which you come in contact.

The railroads will probably be able to carry all of the food stuffs necessary. They will carry the necessary coal and munitions, and they will carry the steel to make ships, *all of the things necessary from the standpoint of winning the war*, and this will not exhaust their capacity. But let us say that it will take 75 per cent of their capacity to perform service of the kind mentioned, leaving 25 per cent of the capacity for the ordinary business of the country. Probably the ordinary business of the country at the present time requires double that capacity, so that part of it cannot be carried, and we must exercise a judicious discrimination. Congress has been asked to pass a so-called priority bill, establishing a small committee of men who will decide questions of the kind—questions of priority of movement. Because of the fact that all things cannot go at the same time, they will endeavor to determine which particular thing ought to go first, from the standpoint of national defense.

There has been, for instance, much complaint from the road and structural builders in Ohio, because the railroads could not handle the sand, gravel and other things necessary in carrying on their work. They appealed to their members in Congress and it looked as if the situation would become serious. However, a small committee of representative men came to Washington, at the suggestion of Senator Pomerene, and the situation was explained to them as clearly as it could be. It was pointed out that we were at war—we were not at peace—that it was idle to say that things would or could go

on as usual while we are at war—idle—worse than that, criminal—because it was misleading, and any serious effort in that direction would tend to prolong the war rather than to shorten it. That was pointed out to them, and it was suggested that they go over the situation and find out what particular things were of most importance and then come back and tell us what they wanted. It was suggested, for instance, that if some among them were using sand at points located on the Pennsylvania, that they should also buy it on the Pennsylvania and not on the Baltimore & Ohio, and *vice versa*, so that the delay due to the transfer of cars between railroads could be cut out. They were delighted to have these and other suggestions. It was pointed out to them that the railroads had not broken down, as is sometimes said,—that never in their history were the railroads carrying as much business as today, but that we must carry those things first that are essential *to the winning of the war*; they said—“Of course, we understand it now; we will go back and co-operate with the local railroad officers and we will certainly try to make lighter your burden and to defer for the present those things that can be deferred without serious detriment.”

I mention that as an illustration; I know of many instances of the same kind. Now you men who come in contact with the public must explain the situation to them, you must say to them that there is *nothing* in this world so important to you, or to them, or to anyone interested in this country as *the winning of the war*. This is the only test we have: “*Will the thing under consideration help win the war?*” If so, it has our support; if not, so long as the war continues, we are not interested in it. I hope you men, because of what I say, will have a little better understanding of the situation when you leave here than have many who are living in the interior, and it is your duty, and your privilege, too, to tell them what the situation is as you understand it, so that they can co-operate and help in what we are all trying to do. My own experience makes me believe that they will accept your suggestions and you will find cooperation instead of complaint.

#### THE RAILROADS' WAR BOARD\*

By Edgar E. Clark

Member Interstate Commerce Commission.

I am glad to take advantage of the opportunity of saying that I personally, and, through me, the other members of the Commission, have had, and still have, entire sympathy with the work of this Committee and with the principles upon which it is founded. We recognize the full effect of, and the principle that lies underneath, the response of the railroads of this country to the needs of the hour as presented to them by the Federal Government.

I think there is a weakness in the average American character in expecting to see the next day after a new plan is formulated, direct, immediate and visible results. And so when a movement of this kind is undertaken you find on the streets and in the newspapers the next morning criticisms that the machinery has been created or provided, but it has not been productive of any good results yet. A movement of this kind if it is to be successful must be undertaken, as this has been undertaken, by laying a foundation.

We have watched with a good deal of care at the Interstate Commerce Commission the results from day to day and from week to week and I can say without qualification or hesitation, in fact, I am glad to say, that within the past few weeks it has been apparent, both on the face of the returns and in the marked falling off of complaints that come to us,

\*Remarks made at a conference of the Special Committee on National Defense of the American Railway Association, Washington, D. C., July 11, 1917. Mr. Clark, representing the Interstate Commerce Commission, sits with the Railroad War Board.



that the efforts of the railroads through this Committee are resulting in great good. A great deal has been done to relieve what was and still is a very serious situation.

We realize that this situation, the congestion on the railroads, the abnormal demand for transportation, came almost out of a clear sky. We realize, as the average person does not realize, that the demands for transportation probably exceed the possibilities even if the maximum of efficiency be worked out. It follows that somebody may have to go without transportation he desires to have.

The Committee and the railroads must get along as best they can, not only under the thoughtless criticism of those who do not take time to study the situation and think it over, but they must meet unfair criticism from people who are trying to direct attention to alleged faults of others in order to avoid having their own shortcomings and evil doings brought into the limelight. There are those, and they are heard through the newspapers and otherwise, who in my opinion are pursuing a studied course to make it appear that the shortcomings of the railroads are much worse than in fact they are, because they do not want the shortcomings of those whom they represent to become known or prominent. So I think it is due to yourselves that the facts should be known. Facts will speak for themselves among the thinking people of the country and the more of the facts that can be put out, the better in my judgment it will be for all concerned.

The principal thing that is complained of by most people is what is commonly called "car shortage." Congress has recently put upon the Interstate Commerce Commission the responsibility in a large measure for movement, distribution, interchange and exchange of cars. That legislation is responsive to a recommendation in the Commission's annual report submitted to Congress in December last at a time when it was difficult to find enough clerks to open the telegrams and letters received, complaining about these things. At that time there was no concerted or unified effort on the part of the railroads to deal with the situation and no apparent evidence of any such intention. The Commission felt that the situation would not grow better as long as the war continued unless there was some centralized general plan for dealing with the situation. If the plan that was later adopted and under which this Committee was created had been in existence at that time that recommendation would probably not have been made. But now that law comes into existence at a time when the railroads themselves are, in my judgment, dealing with this situation in a comprehensive, patriotic, able and fair manner.

It would be most unfortunate if because that law has cast upon the Commission the powers and duties which it does cast upon us, the railroads' officers should feel discouraged in their efforts, and I can say authoritatively that it is not the desire of the Commission that they should so feel, because in so far as our duties reach we hope to work the problems out in cordial cooperation with this Committee. We do not want to interfere with any well laid, well conceived plan that this Committee has formed. We are organizing to perform those duties with those purposes definitely in mind. We wish to establish the best possible means of contact with the Car Service Commission and to have thorough understandings with them. We will have no secrets from them and will consult freely with them on important matters.

It is not perhaps entirely unfortunate that this law was passed, because in any large movement for progress or reform we run against the recalcitrant that will not willingly get into line. So if it becomes necessary in dealing with recalcitrants or insurgents the Commission will have the power to require proper action and will not hesitate so to act. There are many good things in connection with transportation in times of peace and when there is plenty of

transportation and plenty of transportation facilities that seem consistent and proper which in times like these are troublesome and expensive and in a large measure perhaps ought to be modified or eliminated.

The question of reconsignment has been referred to. We are not insensible to the facts that under the rules that have been voluntarily established by the railroads there are many abuses of equipment, and that the carriers are put to the performance of expensive services without due and proper compensation therefor. I have no special authority to speak for the Commission, but I can speak for myself and I believe I speak the sense of the Commission in saying that in so far as our authority is necessary to that end, we are willing to exercise it in moderation in the direction of correcting evils, but we do not think that the right way to cure them is to immediately or at one stroke wipe out all such provisions and practices. There are situations in this country where reconsignment is essential to proper distribution of commodities, and, in many ways, is essential to the interests of the carriers. I have in mind the situation in regard to fuel coal at Detroit, where much trouble has been felt. The industries have grown in the last few years with marvelous rapidity and practically none of them is equipped with facilities for storing a supply of coal which would permit it to operate a month. If these industries are required to order their coal from a given mine consigned direct to their plants it follows that that coal must come with regularity day by day or the plant will find itself out of coal. And so there has grown up at Detroit a system under which the industries depend upon coal dealers who keep a supply coming from the mines all the time, but when it comes from the mines they have no idea who is going to use it. It comes to Detroit and is reconsigned under tariff provisions to the ones who need it, and in that way the city is supplied. We justified in the first instance the establishment of a reconsigning charge of so much per car for reconsignment, a service which the railroads had been performing free. It developed that most of this coal was moving through the Toledo Gateway and the railroads adopted the plan of giving a passing notice at Toledo so that they might get the reconsigning orders before the coal reached Detroit. However, as the congestion was relieved the coal reached Detroit before the reconsignments could be given and recently they have come to the Commission asking reparation in certain instances in which they paid the \$2 reconsigning charge. We said it was a proper charge, that the conditions justified it and that the railroads should not be required to pay it back. I simply recite that as an instance. The point I want to make is that the Commission is not against changing these things in moderation. It is not averse to going step by step, and by long steps in some instances, in the direction of appropriate rules and proper conditions. We do not want to do things too precipitately, and perhaps do as much harm as good.

The thoughts I want to bring to you are of encouragement in this effort, of appreciation of the response, patriotically made by the railroads to the demand upon them, and to convey, if I can, an understanding of them. The Interstate Commerce Commission may not agree in full with all that the railroads would like to have. You differ among yourselves about some things and it naturally follows that others will differ with you. It is impossible for a large number of intelligent men to think alike on all subjects. If they can think alike, they will act alike. We are in sympathy with your efforts, in full sympathy with the plan along which you are acting. I do not believe that the American people in general appreciate the gravity of the situation that confronts our Government. We are not in a war of a milk-white flag. We are in for a very serious and perhaps a very protracted situation and even if peace should come at an early date and hostilities should cease, there is an enormous work for

the United States Government to do to prepare itself for similar situations that may arise within the next few years. There is an enormous work for the railroads of the country to perform.

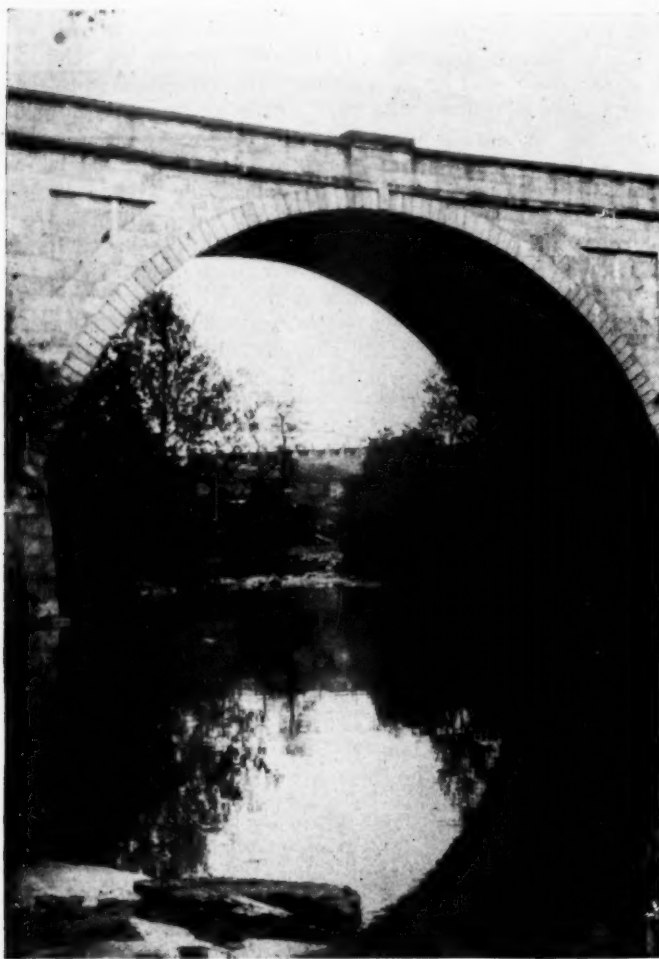
This Committee has adopted a policy, and in the exercise of our duties under the Esch Bill we are going to try to push it along and cooperate with it, to get the cooperation of shippers in increasing the carloading, decreasing the delay to cars and contributing each his little bit, which in the aggregate means an enormous amount. The figures which are contained in the reports of this Committee as to what has been accomplished along that line are very interesting and illuminating and they show great results. If somebody could write them in a readable story for the average newspaper reader it would be appreciated a good deal more than it will be by simply stating the figures.

### AN OLD STONE ARCH BRIDGE

Repairs made recently on what is probably the oldest railroad bridge in service today disclosed some interesting construction details that indicated the skill and ingenuity of the

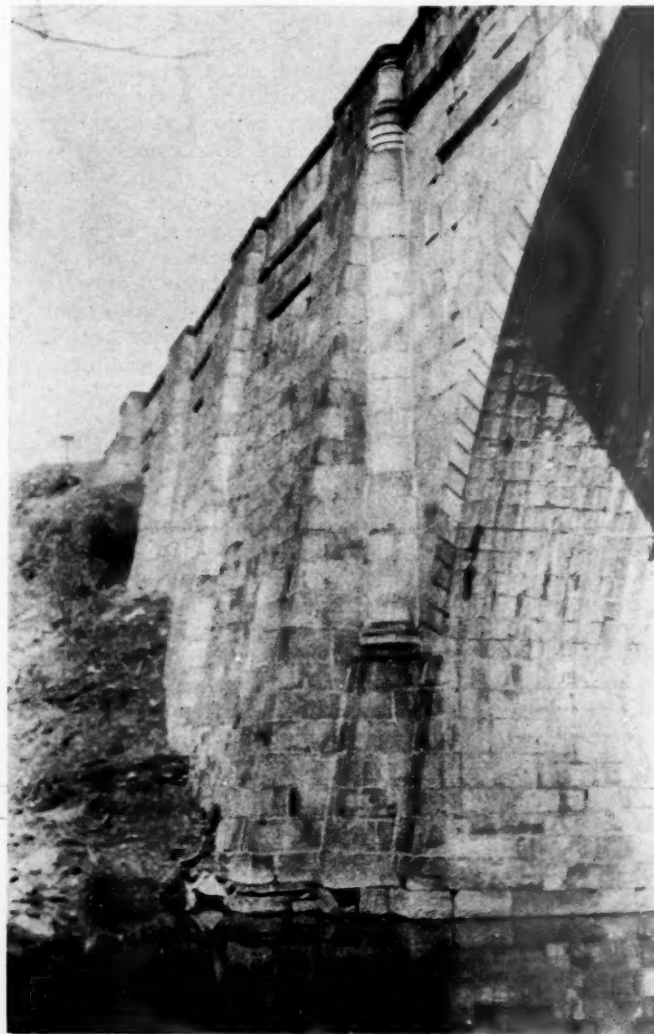
verse 12-in. brick walls resting in the arch rings. These walls are spaced 3 ft., center to center transversely, and 5 ft. longitudinally, and are covered with 12-in. granite slabs, which in turn hold the ballast under the tracks.

It was originally constructed for double track, and, although the equipment it was designed to carry undoubtedly weighed less than the present-day automobile truck, it has



The Arch

bridge masons of nearly a century ago. The structure is 297 ft. long with a central arch with an 80-ft. span and with the base of the rail 65 ft. 6 in. above the bed of the stream. It was constructed by James Lloyd in 1829, as stated on a marble stone set in the parapet wall, and it has, therefore, been in service for 88 years. It is of native granite cut to a true surface and set in lime mortar. Large pilasters were placed at the side walls and extend to about 4 ft. above the original elevation of the railroad tracks to form parapets. The spandrel spaces over the arches are not filled, but the track load is supported on a system of longitudinal and trans-



A Close View of the Abutment

remained in perfect condition under the continually increasing loads, until it is now carrying as heavy loads and traffic as any bridge in the country. No repairs would have been necessary at the present time had not the common practice of raising the track at intervals when applying new ballast brought the rails up to the level of the top of the parapet walls and placed a heavy lateral thrust upon them which they were not designed to carry. This has caused the spandrel walls to move to such an extent that it has been necessary to take them down to the elevation of the top of the arch, and in some places still lower, and to reset them, backing them up with concrete under the track a sufficient distance to take the thrust from the parapet walls. In handling this work special care was taken to replace the stones in their former position in order to preserve the originality of the old bridge as far as possible.

The structure was in serious danger of destruction during the Civil War, but by careful guarding it came through unharmed, and, judging from its present condition, it will continue to serve indefinitely. We are indebted for this information to S. C. Tanner, master carpenter on the Baltimore division of the Baltimore & Ohio, under whose direction repairs and alterations were made.



# Constructive Suggestions on Car Interchange

Prize Winning and Three Other Papers Received in  
the Contest on This Subject. Ideas for Present Problems

**T**WENTY-THREE papers were received in the contest on car interchange which was undertaken by the *Railway Age Gazette* at the suggestion of a well-known railway man who has long been a student of this complicated problem. After the close of the contest on June 10, the papers were turned over to A. M. Schoyer, resident vice-president of the Pennsylvania Lines at Chicago, N. D. Ballantine, assistant to the operating vice-president of the Chicago, Rock Island & Pacific and E. H. DeGroot, Jr., superintendent of transportation of the Chicago & Eastern Illinois, until his recent appointment as chief of the division of car service of the Interstate Commerce Commission, who examined them carefully and unanimously awarded the first prize to O. C. Castle, superintendent of car service, Southern Pacific Lines, Houston, Tex. The second prize was awarded to J. W. Smith, superintendent of car service, Western Maryland, Baltimore, Md., on the decision of a majority of the judges, Mr. Schoyer dissenting because of his disapproval of the suggestions for an equipment company.

Other papers were contributed by E. E. Betts, superintendent of transportation, Chicago & North Western, Chicago, Ill.; J. R. Cavanagh, superintendent of car service, Cleveland, Cincinnati, Chicago & St. Louis, Indianapolis, Ind.; A. C. Hasey, Yonkers, N. Y.; S. W. Fisher, car accountant, Ft. Dodge, Des Moines & Southern, Boone, Iowa; D. W. Brantley, car accountant, Central of Georgia, Savannah, Ga.; J. M. Brickett, chief clerk to general manager, Kansas City Southern, Kansas City, Mo.; T. D. Simmons, car distributor, Seaboard Air Line, Hamlet, N. C.; M. M. McNeel, car interchange clerk, Houston & Texas Central, Hearne, Tex.; J. E. Campbell, Munhall, Pa.; Mark H. Reasoner, Minneapolis, Minn.; R. J. Barry, superintendent, Houston & Texas Central, Austin, Texas; K. V. Conrad, Norfolk & Western, Roanoke, Va.; T. H. Meeks, chief dispatcher, Southern Pacific Lines, Lafayette, La.; Chas. Burlingame, superintendent, Wiggins Ferry Co., St. Louis, Mo.; P. J. Bergeron, chief demurrage clerk, Southern Pacific, Houston, Tex.; H. E. Sanders, car distributor, Kentwood, La.; G. W. Segrest, agent, Galveston, Harrisburg & San Antonio, Markham, Tex.; C. E. Henry, agent, Warren & Ouachita Valley, Banks, Ark.; L. F. McNeill, agent, Houston, East & West Texas, Appleby, Tex.; E. T. Brady, agent, Atchison, Topeka & Santa Fe, Sweetwater, Tex.; and M. L. Reinhardt, agent, Galveston, Harrisburg & San Antonio, El Campo, Tex.

## FIRST PRIZE—A WORKABLE SET OF CAR SERVICE RULES

By O. C. Castle

Superintendent of Car Service; Southern Pacific Lines,  
Houston, Tex.

The writer makes no claim to originality in the rules presented below, as the principles underlying them are almost as old as the history of car interchange. These principles have been advocated by prominent transportation and car accounting officers for more than 30 years, but it seems to have required a world war to give them an opportunity for a fair trial.

The method of car handling now being undertaken by the Commission on Car Service practically ignores the right of the car owner to the control of his individual car, and, in theory at least, recognizes the justness of the principle laid down by the American Railway Association that each road is entitled to the possession of cars equal to its ownership. It seems reasonable to suppose that if car handling methods based on this principle are practicable and desir-

able at a time like the present, they would certainly be practicable and desirable under normal conditions.

I might point out that, under the terms of the contest outlined by the *Railway Age Gazette* no rules which rely on an equalization of balance by the return of the individual car to the owning road can be given consideration, for it is obvious that without an absolute balance in the flow of traffic it is mathematically impossible for an originating road to maintain 100 per cent of ownership solely by means of rules which insure the return of the individual car when released from the original load. Such a road must either receive the empty cars of other carriers to offset its loaded deliveries, or content itself with less than 100 per cent until its own cars are released and returned to it. If the "individual car" method is relied on, originating roads must provide equipment sufficient to handle their traffic through to destination, in which event they do not hope for nor desire the use of their entire ownership.

### CAR SERVICE RULES

#### Definition

"Excess" road—A road having in its possession more freight cars of railroad ownership than the total number of such cars owned by it.

"Deficit" road—A road having in its possession fewer freight cars of railroad ownership than the total number of such cars owned by it.

#### Organization

(1) The territory in the United States and Canada shall be divided into zones by the American Railway Association.

(2) An interchange supervisor shall be selected for each zone, and a general interchange supervisor for the entire territory. The supervisors shall be detached from the employ of any railroad.

(3) The zone supervisors shall have jurisdiction over car interchange in their respective zones, reporting to the general supervisor, who shall report to the Commission on Car Service of the American Railway Association.

(4) The general and zone supervisors shall be empowered to require such reports from railroads as are necessary in the administration of these rules.

(5) The expenses of the general and zone organizations shall be borne by the American Railway Association, and all fines and penalties collected shall be credited to the association.

(6) A penalty and compensation fund shall be created and maintained by the American Railway Association for the purpose of clearing the amounts received and disbursed through the administration of these rules.

#### Operation

(7) All railroad cars shall be considered as "common cars," except as follows:

(a) Special classes of cars assigned by their owners to a defined traffic. This assignment shall be limited to coal, ore, coke, stock, tank and ventilated box cars, and assignments shall be approved in each case by the zone supervisor, subject to review by the general supervisor and the Commission on Car Service.

(b) All cars below 40 tons capacity.

(c) All cars in mechanical condition which will prevent their acceptance in interchange under the provisions of M. C. B. rules.

NOTE: Cars in classes (b) and (c) shall be confined to the rails of their owners.

(8) Any railroad having on its line less than 100 per cent of its owned equipment may make demand for partial or complete equalization; such demand shall be filed with the zone interchange supervisor, and shall specify the class and number of cars required, and the situation with respect to interchange and ownership balance.

(9) On receipt of a demand for equalization, the zone supervisor shall call upon excess roads in the zone to deliver a given number of cars of the required class to the deficit road making the demand.

(10) In the event the zone as a whole shows a deficit the zone supervisor may make demand on the general supervisor for an equalization, giving the necessary data for the lines, with further details as to the preferred gateways through which equalization may be effected.

(11) On receipt of a demand from any zone supervisor the general supervisor shall call upon other zones to deliver a given number of cars of the required class to the zone making the demand. The order shall specify the road or roads to which delivery shall be made, and the period within which the order must be complied with.

(12) In order to apportion the cars received in equalization by zones, a zone supervisor may direct deliveries by deficit roads to other deficit roads, such deliveries in no case, however, to be in excess of the receipts from roads in other zones.

(13) The per diem rate of settlement between carriers shall be fixed at an amount agreed upon to cover the actual cost of owning a freight car, based on the cost of equipment, depreciation, repairs and interest on the investment. The rate shall be in effect throughout the year, and shall be changed only when a thorough investigation develops that the items making up the rate have changed materially.

(14) The Commission on Car Service, on recommendation of the general interchange supervisor, shall fix a *per diem penalty* rate applicable to all cars on the road of any carrier which has refused or failed to comply with instructions from supervisors with respect to equalization of equipment, this rate to apply from the time the equalization order becomes effective until it is fulfilled or cancelled by the interchange supervisor. The penalty per diem shall be in addition to the regular per diem rate, and shall be paid into the penalty and compensation fund of the American Railway Association.

(15) Any deficit road which has made a demand for equalization which is not satisfied within ten days from the date of such demand, shall make a claim against the Penalty and compensation fund of the American Railway Association for per diem penalty on the total car days represented by the unfulfilled demand. The reclaim shall be at a rate per car per day equal to 50 per cent of the average gross earnings per car per day of all cars on the line of the demand road for the six months immediately preceding.

(16) Common cars will be at home on the line where located, and will not be handled empty in interchange except in switch service without instructions from the zone or general interchange supervisor.

(17) An excess road desiring to relieve itself of per diem payments on cars not required for loading may report its condition to the zone supervisor and make tender of all, or a part of its excess. If the zone supervisor fails to give disposition within a period of five days from the date of the tender, the excess road making the tender may reclaim against the penalty and compensation fund for the per diem on its excess cars, such reclaim to cover the period during which the excess continues, or until such time as the zone supervisor shall accept the tender or make a demand for equalization.

(18) On receipt of a tender from an excess road, the zone supervisor will tender to deficit roads in his zone sufficient cars to reduce the excess on the line making the tender, and

failing to find disposition for such cars in his zone will make similar tender to the general supervisor. A deficit road which declines a tender of equipment offered by the zone supervisor will honor a reclaim from the penalty and compensation fund for the per diem on all or a part of the deficit for such period as the deficit may continue, or until the deficit road makes a demand for an equalization.

(19) A car owner desiring the return of some particular car or cars, for a special purpose, may have such car, or cars, moved empty to a junction point with his line on payment of a reciprocal mileage charge of  $3\frac{1}{2}$  ct. per car mile, plus bridge and switching arbitraries.

(20) Roads making excess empty mileage through the movement of cars in equalization will be compensated by such payments as the Commission on Car Service may, after full investigation, find to be equitable.

#### SECOND PRIZE—JOINT OWNERSHIP OF FREIGHT CARS

By J. W. Smith

Superintendent of Car Service, Western Maryland,  
Baltimore, Md.

The various interchange and car service rules for the handling of freight equipment which have been tried out in the past, have all failed at the most critical time, with the result that at present we have a pool of equipment, unregulated, except insofar as the recent orders of the Commission on Car Service of the Railroads' War Board are being made effective. These orders, however, are only emergency measures intended to take care of conditions during a period of war and will not meet the situation when these conditions have passed. The time is, therefore, opportune for developing and perfecting a permanent plan of operation that will meet the situation which will confront us at the close of the war. This plan should be such as will recognize the rights of ownership and assure to each road at all times its full quota of equipment of the particular class or classes it owns, or in which it is interested. To do this with the present diversity of ownership would entail all of the difficulties which have confronted the railroads under the various interchange and car service rules that have been in effect up to the present time. The proper and equitable distribution of equipment between the various lines of the country cannot be accomplished efficiently and economically until some comprehensive plan of ownership is adopted and enforced which will recognize the responsibility of each road to contribute to the equipment of the country its full quota of cars necessary to protect shipments while moving over its rails.

Under the present method of placing upon the originating road the responsibility for furnishing equipment in sufficient numbers to protect the business it originates, and to carry it to destination, many roads have contributed more cars of certain classes than should be required of them while others are grievously delinquent in their obligations to contribute their share. It follows that in times of car shortage, the roads which originate large volumes of business, and which have contributed cars in sufficient numbers to carry this business to destination over the rails of other roads, find themselves depleted of equipment, owing to their cars being diverted and detained on other roads which have not contributed their share of the equipment necessary to take care of the business they originate and handle.

This situation can be overcome and the proper and equitable distribution of cars between the various roads made possible by a readjustment of ownership of the equipment on the basis of what may be termed "A plan for the Joint Ownership of Freight Cars," which may be outlined briefly as follows:

(1) Organize an equipment company, the stock of which shall be owned only by railroad companies; this company to own and control all cars which it is desirable to have placed under joint ownership.



(2) Have this company under a separate and distinct organization with a board of directors elected by the stockholders, and an independent management appointed by the board of directors.

(3) Have the stock of this company issued in different series, representing the different classes of cars owned by the equipment company, and give each railroad the right to purchase stock of any series in amounts representing the number of cars of that particular class desired or necessary to handle its business.

(4) Equalize the balances of equipment company cars on each line on the basis of stock ownership, requiring roads in excess to give up cars within a reasonable fixed period to roads that are short on their proportion, assessing appropriate penalties for failure to do so, and awarding appropriate damages to the road which has suffered.

(5) In times of surplus, require each road to accept and hold on its line its full proportion of cars owned by the equipment company on the basis of stock ownership.

(6) Have an established per diem rate, which each road shall pay to the equipment company for all cars of the equipment company on its rails; this rate should be made sufficient to cover the cost of operation and ownership, including interest, maintenance and depreciation, with a sufficient margin to cover the fluctuations in prices of material.

(7) To enable the management to know at all times the balance of equipment company cars on each road, and properly to equalize these balances between the roads, arrange a system of daily reports to be made by each road to the equipment company showing the total number of cars of each class interchanged with connecting lines; these reports to be made on a basis similar to that provided for in the "Double Entry Daily Balance Plan," for per diem settlements as outlined in the minutes of the No. 10, meeting of the Association of Transportation and Car Accounting Officers, Cincinnati, O., December, 1908, pages 1,216 to 1,240, inclusive.

(8) Have the equipment company assume the obligations and rights of owners, under M. C. B. rules, with respect to repairs and the destruction of cars.

(9) Have the equipment company purchase from the railroad's stockholders any cars in good, serviceable condition which such railroads may desire to turn in under this plan, at a depreciated or appraised value, and have the equipment company purchase such new cars of each class, of standard design and construction, as its funds will permit, and as may be desirable or necessary to protect the business of its stockholders.

The above is only a brief outline of the joint ownership plan, but it covers such of the essential features as will serve to illustrate its value. There are a number of other points, which would have to be considered in working out the details of the plan, and in this connection the following suggestions are offered:

Stock should be sold to the railroad companies at par value only, and should not be transferable except with the consent of the board of directors of the equipment company.

The par value of each share of stock of each series should be sufficient to cover the cost of a new car of standard design of the particular series represented by such stock.

Cars covered by trust certificates, the title of which can not be transferred, and which it might be desirable to place under joint operation may be leased to the equipment company for an annual rental equal to 6 per cent of the depreciated value at the time such lease is executed; certificates of lease to be issued by the equipment company covering such cars which entitle the holders to the same privileges and obligations as stock except as to dividends and assessments.

Amounts accruing from the sale of stock should be ap-

plied to the purchase of old and new equipment, a sufficient amount therefrom being set aside for a renewal account to offset the difference between the price of the old equipment purchased and the par value of the stock representing such cars.

Amounts accruing from per diem should be applied to operating expenses, the payment of rentals on leased cars and the cost of repairs; a sufficient amount being set aside therefrom for renewal account to offset the depreciation of cars in service.

The surplus, if any, should be applied as dividends on stock, while deficits, if any, should be made up by assessment on stock.

The management should be given authority to assess proper penalties against delinquent lines for failure to give up excess cars on demand within a reasonable fixed period to roads that are short on their proportion and award them as damages to the line or lines suffering thereby. These penalties and awards for damages should be sufficient to cover the full amount of loss sustained. The management should be permitted to distribute cars to roads requiring them in excess of their proportion at times when such cars are not required on other lines.

These and other matters of detail, necessary to the working out and inauguration of this plan, should be given careful consideration. I am confident they can all be worked out on a fair and equitable basis.

While this plan is in effect a pooling scheme, and therefore has all the advantages of a car pool, it eliminates practically all of the objectionable features of the various pooling plans which have been suggested. I am submitting it in the hope that it will be given full and careful consideration by all interested in car efficiency, and particularly by those who have the authority to say what shall be done in matters of this kind.

#### A SUGGESTED SET OF RULES

By T. H. Meeks

Chief Dispatcher, Southern Pacific Lines, Lafayette, La.

#### PROPOSED CAR SERVICE RULES

1. (a) The distribution and equalization of railroad-owned or controlled cars between railroads will be directed by the Commission on Car Service.

(b) Railroads will make such reports to the Commission on Car Service as may be required for the purpose of accounting for cars in their possession.

(c) Embargoes will be placed by the Commission on Car Service as may be deemed necessary to maintain an equal distribution of cars according to ownership.

2. All railroad owned or controlled cars to be:

(a) Used irrespective of ownership.

(b) Delivered empty to the home road when belonging to a direct connection.

(c) Delivered empty to the home route at any junction that will make the empty haul shortest.

(d) Delivered to any road for loading.

3. (a) When practicable to do so without delay or additional empty haul, foreign cars must be loaded in the general direction of home and system cars used locally.

(b) Cars designed by the owner for special service shall be so recognized, receive special attention and be sent, either loaded or empty, to or in the direction of the home road.

(c) Private line cars shall be handled in accordance with instructions from owners or lessees.

4. (a) It is incumbent upon a railroad receiving the line haul rate to furnish cars for loading within the switching limits of another railroad when the railroad on which cars are loaded receives only a switching rate.

(b) An equal number of cars, of the same kind, must be returned promptly, loaded within the same switching dis-

trict, or empty, to the railroad from which cars are received in switching service.

5. (a) No railroad will be permitted to retain in its possession more cars than a number equal to its ownership of each kind, and will deliver surplus of cars above its quota of each kind to connecting railroads as may be directed.

(b) A railroad may assign for any period of time, a portion of its quota of cars to another railroad, in which case the number allowed it on an ownership basis will be reduced below the number of its ownership by the equivalent of the cars so assigned to another railroad.

(c) Cars may be short-hauled from one railroad to another through intermediate railroads at a reciprocal rate of  $3\frac{1}{2}$  cents per mile, plus bridge and terminal arbitraries, with a minimum of 100 miles for each railroad handling the cars, the railroad requesting the movement to pay the charges. Intermediate railroads handling cars under this arrangement may load cars received and deliver others of the same kind, when, by so doing, it is possible to reduce the delay and empty haul.

#### DISCUSSION

I have felt the necessity in daily practice for a specific rule governing the handling of cars between different roads in switching movements, regardless of the general balance between the lines concerned, hence the inclusion of rule 4.

Under rule 1-b the Commission on Car Service can require of all railroads a daily report giving the number of car loads of each commodity originating on their lines and the names of the railroads to which they are destined, so that it will be possible to determine daily the total number of loads moving to each line, which movement can be regulated by embargo to the extent of the ability of the destination road to handle the cars promptly.

Under rule 5-b a railroad to which cars are assigned is entitled to retain on its line a number of cars equal to its ownership, plus the number assigned to it by another railroad. The object of this rule is to permit trunk lines to take care of small lines such as coal and lumber roads whose business is principally outbound.

Rule 5-c is intended to cover movements where the intermediate line is not interested in the equalization and should be compensated for the service performed. It has often been found convenient and more economical for a railroad performing the intermediate haul to load the cars so received and substitute for them cars of the same kind at the junction point where billed.

I would also recommend that a rule be added providing a penalty for the violation or non-compliance with these rules, or any instructions that may be issued by the Commission on Car Service.

#### A COMBINED OWNERSHIP AND POOLING PLAN

By S. W. Fisher

Car Accountant, Fort Dodge, Des Moines & Southern,  
Boone, Iowa

To increase the efficiency of car interchange, we have two periods to take into consideration: (1) the normal period when cars are available, (2) the abnormal time when there is a shortage of equipment. The writer's recommendations are very briefly:

(1) To establish an impartial commission supported by the Interstate Commerce Commission. This commission should be composed of an equal number of transportation men representing the eastern, western, northern and southern roads, with one or more men to represent the smaller lines. This commission will have charge of per diem assessments, the preparation of car service rules, and the distribution of equipment when necessary. It should have full plenary powers, and its decisions should be final. Violations of its orders should be subject to fine.

(2) During normal times, the commission should issue such

instructions as will insure car owners getting their equipment. It would be impracticable to have all cars in a pool during such a period. This plan would enable the car owner to place his cars in first class serviceable condition, he alone having all the necessary material to do so. Rules similar to those issued by the Commission on Car Service on April 18, 1917, to take effect on May 1, 1917, eliminating the penalty feature, should be placed in force, fixing the per diem rate of 75 ct. per day for closed cars, and 40 ct. per day for open cars, except that where a car owner does not average 60 per cent (or any reasonable per cent as fixed by the Commission) of his equipment on his line for the month his cars should earn \$2 per day; i. e., where a car owner does not average 60 per cent of his equipment on his line during the month of January, the Commission will instruct all lines to pay such an owner \$2 per day per diem for the month of March. If in February the per cent on the line to the total ownership is 60 per cent or more, the per diem will automatically go to 75 ct. or 40 ct. per day for April. I recommend the short routing of equipment to owners and the interchanging of empty mileage.

(3) During an abnormal period, the writer recommends the pooling of all equipment. Car distributors should be stationed at certain points throughout the country, the roads reporting their situation by wire each day to the car distributor in charge of those roads. Distributors will take care of the distribution of equipment in their territories. Wire reports should be consolidated into one form and mailed promptly to the commission which should be centrally located. If car distributors cannot supply equipment within their territory, they will immediately wire the Commission. The distribution of equipment should be carried out along such lines as can be accomplished with the minimum empty mileage.

It is the writer's opinion that the unsatisfactory car interchange may be attributed to the very low per diem rate. There has been too much difference between the freight earnings and the per diem. It is essentially wrong for a road to build cars for its requirements, be deprived of their use, pay the car repair bills, the interest and the insurance, assume the depreciation, etc., and then go begging for equipment.

Considering past experiences, the writer firmly believes that the car owner should by all means be recognized during a normal period, while during abnormal times all equipment should be pooled, eliminating unnecessary mileage and the distribution being made according to ownership and requirements.

#### WORKING ON CAR BALANCES

By A. C. Hasey

No condition tends to destroy freight car efficiency as much as the empty car movement incidental to the obligatory return of freight equipment to the owning roads, with the cumulative delays at successive junction points for home route rights. This is an evil of disastrous effect, reducing the use of equipment to an enormous extent and entailing a dead loss in operating expenses. If, instead of computing per diem on each individual car and in the haste of relieving a road of per diem charges, sending a car on a journey of hundreds of miles empty, the basis of per diem was upon the excess of cars held on each road over the total owned, calculated upon a debit and credit system with rights and values on all cars regardless of ownership and with a per diem charge fixed at a figure large enough to produce the incentive to keep the quota on each road near its allotment, the result would be accomplished.

Regional offices could be established covering an area sufficiently limited to prevent too large a volume of reports, to which would be reported all cars interchanged between roads in that territory in classes and a debit and credit maintained with each road daily and in turn reported to a cen-



tral office, where accounts would be balanced and settlement made monthly. Each road should take a tally of all cars and ownership in classes on the line as of the date accounts were started in the regional and central offices, with an allowance of one or two months for the adjustment of discrepancies, when settlement would begin upon the basis thus established and each road be charged at the determined per diem rate for all cars in excess of its quota.

A road having a monthly aggregate of 425 cars on its line in excess of its quota would pay per diem at the prevailing rate to the central office and a road with a monthly aggregate of 225 cars less than its quota would receive per diem on that number, preferably settled in classes. Re-claims between respective roads would be settled by the roads direct as at present. This would be the only clerical force required by each road for per diem settlement, and would result in an appreciable reduction in clerical expenses from the present methods that would offset the expense of maintaining regional and central offices.

No obligation would exist to forward cars home or in a homeward direction empty and therefore empty car mileage and car haul expense would be unpleasant memories only. A road would have the right to use any car for loading in any direction, and could be obligated to make repairs at its expense on all cars on its line, except possibly owners' defects on cars which have left home rails within a certain established period.

Accumulations caused by abnormal conditions such as existed recently in the export trade could always be anticipated and met by embargoes, and when, conversely, there was a stagnation of business and a surplus of equipment, arrangements for storing a certain quota on each road, regardless of marks, could be made effective, upon which per diem would not be charged, an arbitrary number deducted, and per diem responsibility based upon a new quota for each road.

This method would undoubtedly save enormous expense in new equipment and empty haulage. The objection that may appeal to some of having a large number of foreign cars on lines would not have much force, as this evil would not be much greater than at present. Now one foreign car is hurried toward home empty to be replaced by another foreign car and this one likewise handled, whereas under the method proposed the one car might remain longer on one road, but the result would be the same.

This situation could be met by a "gentlemen's agreement" to load cars in the direction of home where possible, and should actually accomplish such a purpose more than present rules, with the restrictions created by the present obligation to send cars home empty, which reduces the availability of cars for use, and produces more cars available for the protection of loading in all directions.

This plan may appear on the surface to be a radical change, but a remedy of present conditions must be radical, and national exigencies demand now or in the near future an eradication of the pernicious method so inimical to industrial economy and progress.

**CHINESE RAILWAY INCOME IN 1916.**—The total income derived from Chinese railways during 1916 amounted to \$30,997,471, an increase of \$2,415,800 compared with 1915. The total expenditure incurred was \$14,839,614, or \$265,140 less than the previous year.

**RAILWAY CONSTRUCTION IN ARGENTINA.**—The following six lines are under course of construction in Argentina: Pichinal to Oran, Province of Salta, 17.4 miles; Nare to San Javier, Province of Santa Fe, 45 miles; Catamarca to Tucuman, 115 miles; Talapampa to Alemanía, Province of Salta, 6.8 miles; Metan (Province of Salta) to the east, 150 miles; and Milagro (La Rioja) to Quines (San Luis), 85.6 miles.

## NEW YORK CENTRAL THRIFT SPECIAL

The thrift special of the New York Central ended a three weeks' run on August 11 after making its way through the heart of New York state bearing the latest message on canning and conservation to the housewives of that section. The car started its run at Pulaski and ended at Hudson, and was one of the most effective means of following up the patriotic



The Exhibition Car

planting movement, with practical suggestions for utilizing the large surplus of vegetables and fruits.

The car was run in co-operation with the Home Economics Department of the State College of Agriculture at Cornell and with the New York State Food Supply Commission. Two expert home economics workers were aboard to demon-



An Interested Audience Watches the Canning Demonstration

strate the best methods of preserving food, to distribute literature and to answer all questions asked by the women who flocked to the daily demonstrations. The train was made up of two cars, one a regular passenger coach equipped at one end for canning demonstrations, and another fitted out with an exhibition of home canned products, with the best equipment for canning and drying, and with suggested labor-sav-

ing devices for the home. It was, in fact, an itinerant school in home economics and bureau of information on all subjects pertaining to the present emergency food situation.

The schedule of the special was mapped out some time in advance and the country adjacent to each town was placarded with the announcement of its arrival. The car stayed one day in each town on the schedule and with its flying stars and stripes and signs bearing the words, "Thrift Campaign" and the slogans, "Waste Nothing," "Practice Patriotism," was a valuable object lesson in conservation. Each afternoon a two-hour demonstration was given in the canning of various products by the home economics experts.

The visitors to the car averaged 150 or 200 a day, in spite of the terrific heat which lasted through a good part of the run.

### RAILROAD BUILDS COW BARN

Efforts to secure economy in the construction and operation of railroads as well as in the maintenance of the road and equipment, or in extending their commercial influence, have frequently led railroads into activities more or less remote from pure railway transportation. As an illustration of the diversity of such activities the Boston & Albany recently constructed a sales cow barn at Brighton Stock Yards, Boston. This building is the property of the railroad but is leased and operated by the Brighton Stock Yards Company of Boston.

The new barn is 215 ft. long and 138 ft. wide of reinforced concrete throughout with metal sash and standard fire doors. The floor is concrete and the stanchions are all metal, making the building as fireproof as possible. The



A View Along One of the Alleys

risk of a fire in the feed and bedding is provided for by the installation of nine hose lines distributed at convenient points in the service alleys, and also by the placing of fire extinguishers near each of the doors.

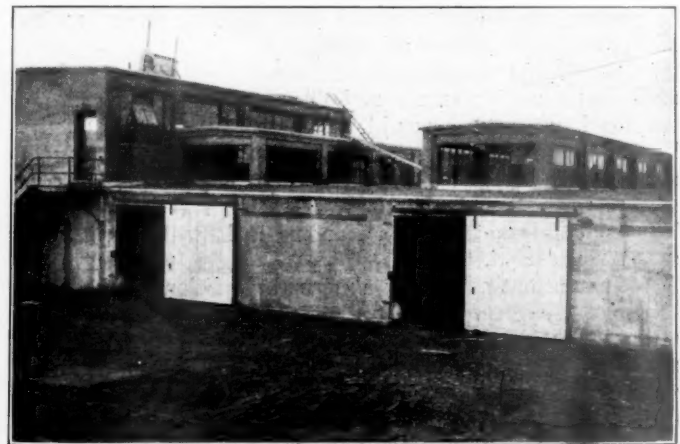
The federal cattle inspectors examine all cattle in this barn and therefore the distribution of light, both natural and artificial, required careful study. It was finally determined to eliminate all side lighting and secure natural lighting altogether from overhead, and artificial lighting by the distribution of a large number of small unit electric lights.

The elimination of all windows in the outside walls of the building was also to reduce maintenance costs for broken glass, which is found to be a very heavy item in buildings lighted from the sides. The lighting results are beyond expectations, and have worked out most satisfactorily, every part of the building being uniformly lighted. It will be noted from the photographs that the light falls directly on

the backs of the cattle and is so full that it will not be necessary to take them out of the stalls in order to make a full examination. This, it is expected, will reduce greatly the time required for inspections.

The building will accommodate 400 head of cattle. A complete drainage system is provided so that every part of the interior can be disinfected and washed down, hydrants being provided for that purpose. A small restaurant for use on sales days is provided at one corner of the building, adjoining which is an office and sleeping quarters for the cattle inspectors. These quarters are heated by steam and hot water is also provided.

Construction on the building was started on March 12, 1917, and it was opened for business July 9, 1917, 21 days ahead of the contract time allowed. The piers, foundation walls and walls were built of 1: 2: 4 concrete, the outside



A Portion of the Exterior

being given a rough surface and the inside a smooth surface. The granolithic floor was constructed of 1: 3: 6 concrete for the lower 4 inches, with a 1-in. finish of 1 to 2 mortar laid simultaneously with the concrete and finished with a wood float. At least 8 in. of engine cinder was laid under the concrete and thoroughly compacted before the floor work was started. The roof slabs were constructed of 1: 2: 4 concrete reinforced with Kahn bars. The total cost of the building and paving adjacent thereto was \$70,000.

The barn which this building replaces was of timber construction and required a constant force of six to eight carpenters to maintain it properly; it was destroyed by fire after having twice suffered damage from this cause. The new building was designed and constructed by the engineering department of the Boston & Albany, under the direction of F. B. Freeman, chief engineer, to whom we are indebted for the above information.

**MILITARY TRANSPORTATION.**—Speaking in the House recently as to the work done during the year by the Ministry of Munitions, Dr. Addison said: "The other day Sir Douglas Haig paid a high tribute to the work of military transportation. It has been the duty of the Ministry (of Munitions) to supply the goods, except that the transfer to France of a certain amount of existing railway stock was undertaken by the Railway Executive Committee. The quantity of locomotives, trucks and track required was so great that to manufacture all in time—even if there had been the raw material to spare, which there was not—would have been an impossibility. To meet the program track was pulled up at home. India, Australia and Canada sent their contributions. More than 2,000 miles of track have already been supplied in a complete condition, and nearly 1,000 locomotives of various kinds, apart from hundreds supplied by the Railway Executive Committee."



# A 120-Ton Coal Car for the Virginian

One of Four Experimental Cars Built Without Drop  
Doors to Unload in the Car Dumper at Sewalls Point

By B. W. Kadel

ONE of the four experimental 120-ton gondola cars which are being constructed for the Virginian Railway by various builders, has recently been completed and delivered by the Virginia Bridge and Iron Company, Roanoke, Va. The design of this car demonstrates certain special features of construction of this class of equipment. It is built for use in bituminous coal carrying service between the West Virginia fields and the tide-water terminal of the Virginian

The ratio of stress to end strain for this sill is .057, a factor well within the recommendations of the M. C. B. Association. In addition to this there are no open holes or cuts of any description in the sill, it is well braced and stayed both in a vertical and a horizontal plane, and it is not called upon to carry any of the weight of the lading, thus eliminating vertical bending.

To prevent the center sill from receiving bending stresses



Virginian 120-Ton Flat Bottom Coal Car Built by the Virginia Bridge & Iron Company

at Sewalls Point, Va., there to be handled over the road's car dumper.

The principal dimensions of the car are as follows:

Length inside .....	50 ft.
Length coupled .....	53 ft. 7 in.
Distance between truck centers .....	37 ft. 4 3/4 in.
Width inside .....	9 ft. 8 1/2 in.
Width over all .....	10 ft. 3 1/2 in.
Height of sides above rail .....	11 ft. 1 1/2 in.
Height of sides inside at ends .....	7 ft. 3 3/4 in.
Volume level full .....	3,785 cu. ft.
Volume with 30-deg. heap .....	4,422 cu. ft.
Truck wheel base .....	9 ft.
Truck weight .....	16,350 lb.
Capacity .....	218,000 lb.
Weight .....	73,900 lb.
Ratio of revenue load to total load with 10 per cent overload .....	76.4 per cent

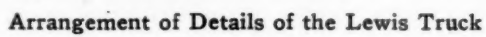
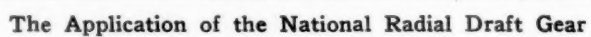
The car body is of plate and angle construction with Carnegie cross-tie sections for side stakes and end plate stiffeners. To provide for corrosion the minimum plate thickness is 1/4 in., and no angles of less than 1/4-in. stock have been used. Heavier stock is used wherever needed.

The principle of the design is that the weight of the lading actually be transferred to the sides of the car, the integrity of the center sill as a draft member being maintained. The center sill is a Bethlehem 12-in. 84.5-lb. H-section and extends not quite to the bolster at either end of the car. The ends of the center sill are milled and are attached to steel castings, which form a portion of the National Malleable Castings Company's radial draft gear, so that the buffing forces are delivered to the center sill, not through the rivets, but as direct loads upon the ends of the sills. The center plates are integral parts of these steel castings.

of any moment from the lading, three plate girder diaphragms are provided to carry the load out to the side plate girders. These have the compression members passing continuously over the center sill and the bottom or tension members passing under the sill. At the outer diaphragms the floor line of the car is dropped down to the plane of the lower face of the center sill, thus increasing the capacity of the car and lowering its center of gravity.

The sides are constructed of 1/4-in. plates with a bottom chord of angle section and a bulb angle for the upper chord. From the depressed portion of the floor to the ends of the car the size of the bottom chord angle is reduced, as its load is less nearer the bolsters. The side plates are also cut away here in line with the floor over the trucks, not only to eliminate unnecessary metal, but to give an unhindered view for the inspection of the trucks. No cross-ties are used, the sides being stiffened by means of wing plates which extend between the diaphragms and the inside side stakes. Between the diaphragms are located the stakes on the outside of the car so that they bear against the blocking on the cradle of the car dumper. The top angle, grab irons, etc., are thus protected, while the alternating inside stakes with their stiff wing plates support the car and prevent the sides from bending in when the cradle is rotated. The ends of the car are stayed against bulging by means of two Carnegie cross-tie sections extending from side to side. Because of the excessive depth of the car at the ends inside ladders are supplied.

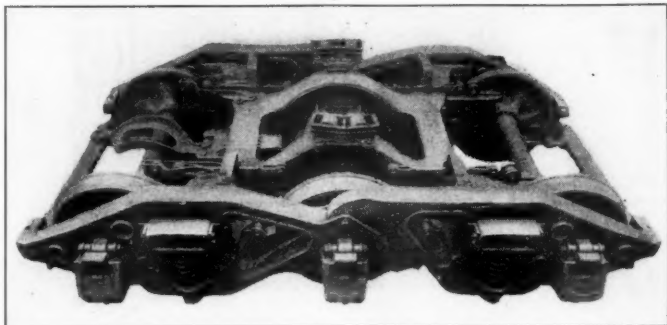
The sides of the car are carried by the body bolsters which





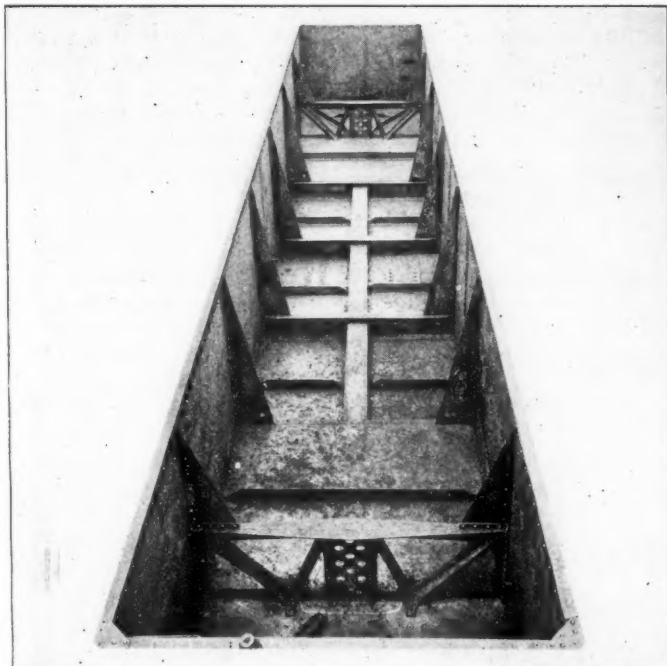
are of novel construction. They are integral steel castings, located above the floor of the car within the coal space, and are shaped not only to give an economic and advantageous disposition of the metal for the various conditions of load applications, but at the same time to offer no obstruction to the coal in dumping. Wing plates extend upward from the outer ends of the bolsters to stay the sides of the car. The bolsters are a product of the American Steel Foundries.

The floor is stiffened between the diaphragms with angles. The diagonal angles for stiffening against poling are located above the floor to clear the brake rigging of the trucks.



Lewis Articulated Six Wheel Truck

Because of the great weight of the car it is necessary to provide definite jacking points specially designed to take care of this operation. Two jacking blocks are provided at each corner of the car, the one being under the end of, and in reality a part of, the cast-steel body bolster, the other being a part of the corner poling pocket. Either of these blocks will support the load of that corner of the car, so that the



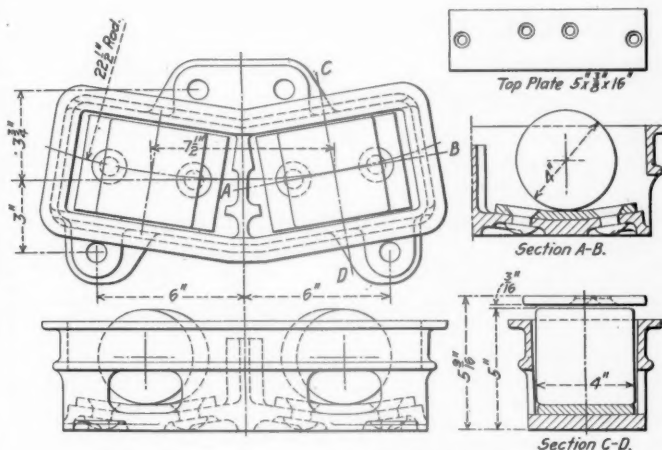
Interior of the Virginian Coal Car Showing the Unique Steel Transom Castings

car can be jacked up at one of these points and stooled at the other. The jacking face on the bottom of the push pole pocket bears directly against the bottom end of the corner angle of the car body, and serves to strengthen the push pole pocket and the corner of the car. The push pole pockets also have bracket portions which extend out and engage stops on the cradle of the dumper, should the overhead clamps for

any reason fail to hold the car when in inverted position. This feature is used on other equipment of the Virginian Railway. Wooden planks are set into the outline of the center-sill section to present a smooth face for the sliding of the coal and prevent its hanging up when dumping the car. These are held in place by means of removable stops upon the diaphragms, and are accessible from the outside. No open holes are left in the center sill for securing this planking.

The trucks for this car are of the Lewis Articulated\* six-wheel type manufactured by the American Steel Foundries, and are equipped with McCord pressed-steel journal boxes of the Vulcan type and Davis cast-steel wheels. Each truck weighs 16,350 lb. The length of the wheel base is 9 ft. and the height of the center plate is 26½ in. above the rail. The center plates are 16 in. in diameter, and are machine faced. The bolster springs are of extra large capacity. The bolsters are fitted with Stucki Frictionless side bearings of the two-roller type, the rollers being four inches in diameter and four inches long. The axles are M. C. B. Standard with 6-in. by 11-in. journals.

The car is equipped with the Westinghouse Air Brake Company's empty and load brake. A 16-in. by 12-in. load cylinder and 10-in. by 12-in. empty cylinder are used, the latter having a 4-in. preliminary slack take-up piston. The brake is designed to give a braking power of 40 per cent for the empty or loaded car. The trucks have clasp brakes, the arrangement of which has been worked out especially to prevent excessive reaction loads in the side frames. The foundation brake gear and the clasp brakes were furnished by the



The Stucki Two-Roller Type Side Bearing

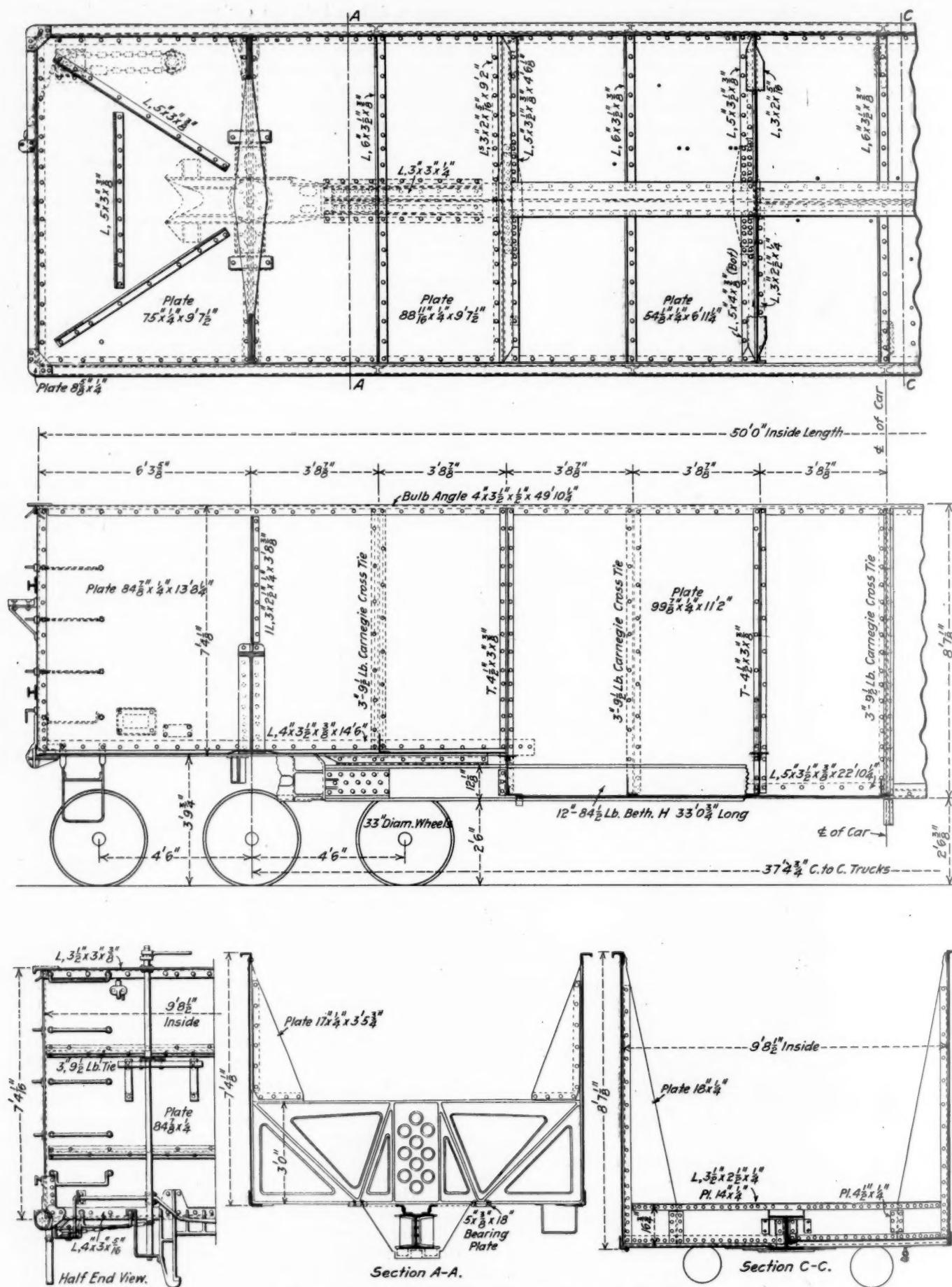
American Brake Company. The Banty ratchet hand brake is used.

The car is equipped with the National Malleable Castings Company's radial draft gear, which is pivoted to the ends of the center-sill construction, and is swung with the truck through the medium of an arm connected with the truck bolster. The draft gears at all times stand approximately tangent to the track and in line with each other, so that in buffing the forces have little tendency to displace the couplers. The coupler heads are specially made with side abutments or stops which allow but a limited movement of the couplers out of line in buffing.

The volume of the car is 3,785 cu. ft. level full and 4,422 cu. ft. including a 30-deg. heap. Its light weight, including the specialties mentioned, is 73,900 lb., of which 32,700 lb. is in the trucks and 41,200 lb. is in the body.

While it is generally known as of 120 tons capacity, the car in reality is stenciled 218,000 lb. in order that the allowable loads for the 6-in. by 11-in. axles may not be exceeded

\*For a description of this truck as originally designed, see the American Engineer for January, 1913, page 35.





when the car is given a 10 per cent overload. On this basis the load per pair of wheels with 10 per cent overload amounts to 52,283 lb., or a load of approximately 49,900 lb. on the M. C. B. 50,000-lb. axle.

The car represents the results of extensive experience and careful study and was worked out jointly by the builders and the motive power department of the Virginian Railway. The aim in the design has been to eliminate as far as possible all useless metal and to this end an especially careful analysis of the known forces and stresses was made. Under the most extreme conditions of loading, the extreme combined stresses have not been allowed to exceed those given in the table, based on 10 per cent overload in the car. As far as possible

STRESS LIMITATIONS OBSERVED IN DESIGN OF VIRGINIAN 120-TON COAL CAR  
Stress, lb. per sq. in.

	Structural parts	Steel castings	Rivets
Tension .....	13,000	9,000	.....
Compression ..	13,000	9,000	.....
Shear .....	9,000	8,000	8,000
Bearing .....	.....	.....	16,000

the secondary stresses have been analyzed and allowed for, and it is hoped later to have available for publication the method of calculation for the various portions of this car.

### MORE CARS ORDERED TO WEST AND SOUTH

To facilitate the prompt movement of grain and food products, as well as lumber and munitions, the Car Service Commission of the Railroads' War Board has ordered the immediate distribution of 20,790 additional empty cars among the lines operating in the South, the West and the Southwest, some of which will go from the East to the Pacific Coast.

This will make a total of 106,033 empty cars that have been ordered moved from one railroad to another, regardless of ownership, during the past three months, in order to mobilize in different sections of the country a sufficient number of cars to handle the abnormal government and commercial traffic that war conditions have produced.

Of the latest cars ordered by the War Board to be distributed where they will be most needed, 7,800 are to be placed in the grain-producing country. One thousand of these go to the Southern Pacific, and 500 to the Western Pacific, to insure the speedy movement of a huge shipment of barley. Other roads receiving cars to accelerate the movement of grain and farm products are the Missouri, Kansas & Texas, the Missouri & North Arkansas, the Kansas City, Mexico & Orient, the Atchison, Topeka & Santa Fe, the Missouri Pacific, the Wabash, the Nashville, Chattanooga & St. Louis, the Chicago, Rock Island & Pacific, the Illinois Central, and the St. Louis-San Francisco.

To protect the vegetable and Southern watermelon crops, more than 5,000 cars have been sent to the Atlanta, Birmingham & Atlantic, the Central of Georgia, the Seaboard Air Line, the Atlantic Coast Line and other roads operating in the Southeast.

Meanwhile, hundreds of cars are being rushed daily to the lumber states of the South to take care of the tremendous movement of lumber to the army cantonments and shipbuilding yards.

In addition to the demand for lumber, the war has practically doubled the orders for phosphate rock during the past three months. This product, which is essential to the operation of sulphuric acid plants and the manufacture of munitions, is also used as a foundation for fertilizer. In the past, the coastwise vessels carried a large volume of it, but with the reduction in the number of vessels used for freight purposes along the coast, practically all this traffic has been diverted to the Atlantic Coast railroads. As a result, it has been necessary to send thousands of cars into that district.

To protect the movement of sulphur for the munitions factories, hundreds of cars have been ordered to the Kansas

City Southern, the Southern Pacific and the Gulf Coast Lines.

More than a thousand stock cars have also been sent into Texas to enable the cattle raisers there to get their herds into the western pasture country.

The roads to which the latest order of 20,790 cars has been consigned, together with the number of cars consigned to each, are as follows: Central of Georgia, 1,300; Chicago, Peoria & St. Louis, 200; Mississippi Central, 135; Southern, 3,025; Atlantic Coast Line, 1,700; Illinois Central, 600; Georgia, Florida & Alabama, 30; Missouri Pacific, 600; Richmond, Fredericksburg & Potomac, 100; Georgia & Florida, 300; Tennessee Central, 100; Georgia, 200; Seaboard Air Line, 1,000; Louisville & Nashville, 1,700; Mobile & Ohio, 1,000; Louisiana Railway & Navigation Company, 500; Wabash, 1,000; Missouri, Kansas & Texas, 1,000; St. Louis Southwestern, 500; Carolina, Clinchfield & Ohio, 300; Chicago & Alton, 500; Louisiana & Arkansas, 200; Missouri & North Arkansas, 300; Kansas City, Mexico & Orient, 500; Chicago & North Western, 500; Atchison, Topeka & Santa Fe, 500; Nashville, Chattanooga & St. Louis, 500; Chicago, Rock Island & Pacific, 500; Southern Pacific, 1,000; Western Pacific, 500; St. Louis-San Francisco, 500.

Fourteen thousand seven hundred of these cars, or a little more than two-thirds of the entire order, are to be supplied by the Pennsylvania System. The other roads that have been ordered to supply empties include the Western Maryland, Philadelphia & Reading, Cleveland, Cincinnati, Chicago & St. Louis, Boston & Albany, Boston & Maine, Central Railroad of New Jersey, New York, Chicago & St. Louis, Chesapeake & Ohio and the Norfolk & Western.

### WASHINGTON CORRESPONDENCE

WASHINGTON, D. C., Aug. 14, 1917.

#### REORGANIZATION OF THE INTERSTATE COMMERCE COMMISSION

President Wilson on August 9 signed the bill providing for the reorganization and enlargement of the Interstate Commerce Commission, which requires him to appoint three new members, including a successor to the late Judson C. Clements, to bring the number up to nine. As President Wilson appointed Commissioners Hall and Daniels, a majority of the reconstituted commission will, therefore, be his appointees. It is reported that the President will send his nominations to the Senate this week. The names of nearly 100 candidates for the position have been recommended to him.

It is assumed that shortly after the new members are chosen the commission will be able to announce its organization into divisions as provided by the law, as it has had this plan under consideration for a long time, while the bill has been progressing slowly through the various parliamentary stages for nearly two years, and because it was suggested by the commission itself in order to enable it to organize its work in a way to promote greater efficiency. Under the old law all acts of the commission were presumed to represent the combined judgment of all its members, and although the great mass of work imposed on the commission naturally required it to delegate much of its work to subordinates and in many cases opinions were written mainly by examiners or represented the work of one commissioner only, the fact that the entire commission was technically responsible for everything that was done naturally made each member feel it incumbent upon him to give at least some personal attention even to minor matters. Under the new plan the commission may place responsibility for various departments of its work on committees or divisions of its members who may act for the commission and have all the jurisdiction and powers now conferred by law upon the commission. This will relieve other members of the commission from the responsibility of keeping in close touch with the

work that is delegated to divisions except in cases of great importance. Provision is made for a rehearing by the entire commission as provided in the act.

A few years ago it was customary for members of the commission personally to travel about the country hearing rate cases. Of late years the volume of business handled by the commission has increased so greatly that this has not been possible. The commissioners are in Washington most of the time and hearings are usually held before examiners, or attorney-examiners, who not only take the testimony but review it and in the majority of cases prepare the opinions, under the supervision of a commissioner. The opinions as written are then passed upon by the commission in conference and either approved, modified or sent back to be rewritten. In important cases the opinions are written by commissioners with the assistance of the examiners and attorneys who heard the evidence.

Under the division plan the entire commission need not participate in the conferences in ordinary rate cases, but the work of the examiners will be reviewed by a division, which under the law must consist of at least three members. Ordinarily the decision of the division will be final except in cases of such importance that the entire commission will want to pass on it, or where a rehearing is asked.

Within the past year or so the commission has considerably expedited and simplified its work by the plan of serving on the parties in advance copies of the examiners' tentative report as the basis for the oral argument before the commission. In this way the argument may be confined to the findings and time need not be wasted in arguing points which have been accepted. In many cases oral argument is heard by the examiner at the conclusion of the testimony.

The plan of submitting the tentative report has worked very satisfactorily, in the opinion of those who practice before the commission, and has enabled the commission to issue its final decision in a much shorter time after the submission of the case, than was formerly required.

The commission has also issued the following notice to those who practice before it, making suggestions for further conservation of time in arguments before it:

"Increasing demands make it imperative that the time of the commission be conserved as far as possible. The principles applicable in tariff cases are fairly well known to all of us. There is relatively little controversy about the facts. The issue usually turns upon the significance of those facts, under the principles applicable, as determinative of the controversy.

"The commission feels justified in asking counsel to confine their attention in oral argument to those features which in their judgment are determinative. The detail is presented in the record, can be developed on brief, and is largely susceptible of check by comparison with tariffs or reports on file.

"The opportunity now afforded for argument before the attorney-examiner at the close of the hearing conducted by him and our present practice of putting out his statement of facts and proposed conclusions in advance of the argument tend to clarify and focus the issues for oral presentation before the commission.

"In such case the proposed report of the attorney-examiner and the exceptions thereto should be used as far as possible as the basis of the argument. The statement of facts as given in the proposed report, if accurate and adequate, need not be repeated unless in an expository way at the opening, and the argument should be directed as far as possible to the conclusions suggested by the attorney-examiner.

"Much expenditure of time and money will be obviated if the parties on the same side of a controversy agree in advance upon the person or persons who shall come to Washington and make the oral argument. Their interests can be more effectively presented in 60 minutes by one or two counsel than

by half a dozen speaking 10 minutes each. Hitherto it has not been customary to apportion the time among those desiring to be heard until after they presented themselves on the morning of the day set. Hereafter Frank C. Stratton, chief of the commission's docket division, should be advised at least 10 days before the day set of the selection of counsel and the time needed.

"From and after resumption of arguments in October, the time allotted will ordinarily not exceed one hour in minor cases and three hours in major cases, except as exceptional complexity or importance may in the judgment of the commission warrant exceptional treatment."

#### APPROVAL OF RATES BEFORE FILING

The new provision in the bill which became a law on August 9, that no increased rate shall be filed except after approval has been secured from the commission, will work a considerable change in the methods of filing tariffs. It was adopted by Congress, with very little consideration, although after the conferees appointed by the Senate and the House had discussed it with members of the commission and a representative of the railroads, as a substitute for the Senate amendment proposed by Senator Smith. The purpose of the Smith amendment was to prevent any increase in rates without suspension if any one in the United States filed a protest. The new provision is far less drastic and, as the commission already had the power to suspend rates, either on protest or on its own initiative, it would seem that about all it has accomplished is an increase in the amount of red-tape involved in getting tariffs made effective. Heretofore the railroads have simply filed their tariffs 30 days in advance of the effective date, the commission's tariff force has checked them over to see that they complied with the rules, and, ordinarily, unless there has been a protest, they have automatically gone into effect, the shippers having been given an opportunity to make any protest by the 30 days' public posting.

Now the commission will have to take some action before the tariffs can even be filed, but, according to the law, this approval may, in the discretion of the commission, be given without formal hearing, and in such case shall not affect any subsequent proceeding relative to the rate involved. In other words, approval of the filing of a rate in such circumstances does not carry any decision as to its reasonableness, and protests or complaints may be filed after the filing or after the effective date of the tariff, as before. The commission is given power to prevent even the filing of an increased rate if it desires to do so, but it is rather difficult to understand how this represents any real increase in the power it previously possessed to suspend a rate that had been filed or to declare it unlawful, although it might make it rather difficult to secure a review of the commission's action. The commission has issued a notice to all carriers to cover the tariffs that were in transit to the commission at the time of the signing of the bill.

The commission's notice states that the act means "that the approval of a proposed increased rate, fare, charge, or classification must be secured before the tariff containing it is forwarded to the commission for filing," and adds:

"As tariffs are at all times in transit to the commission for filing and in order to avoid unnecessary complications due to invalidation of such schedules, the commission approves, without hearing, such increased rates, fares, charges, or classifications as may be included in tariffs which are forwarded for filing prior to August 15, 1917.

"As to increased rates, fares, charges, or classifications contained in tariffs that are issued or forwarded for filing on or after August 15, 1917, the approval of the commission to the increased rate, fare, charge, or classification must be secured before the tariff is forwarded for filing, and as to all



such tariffs that are issued on or after August 25, 1917, the title page must bear reference to the serial number and date of the commission's approval."

#### PRIORITY BILL NOW LAW

The President also signed on August 10 the bill authorizing him to direct that such traffic or such shipments of commodities as, in his judgment, may be essential to the national defense and security, shall have preference or priority in transportation, but he has not yet designated the person or persons to issue such directions for him. In adopting the House substitute for the Senate bill Congress omitted the provision which would authorize carriers to enter into agreements for the division of earnings, and also the amendment to the Senate bill proposed by Senator Reed authorizing the Interstate Commerce Commission to order the railroads to acquire equipment.

#### UNLAWFUL TO LIMIT TRANSPORTATION FACILITIES

The food control bill, passed by Congress last week, in section 4 carries a provision making it unlawful "to conspire, combine, agree or arrange with any other person to limit the facilities for transporting, producing, harvesting, manufacturing, supplying, storing or dealing in any necessities." A number of senators, particularly Senator Hollis of New Hampshire, who often acts as spokesman for the railroad brotherhoods in Congress, opposed very vigorously the idea of including such a provision without some proviso to prevent it from operating against "peaceful" strikes. Senator Hollis wanted it qualified by an amendment stating that "nothing in this act shall be construed to repeal, modify or affect either section 6 or section 20 of the Clayton law," designed to prevent the prosecution of a strike conspiracy under the anti-trust law. Other senators who discussed this provision of the bill asserted that it could not be used to prosecute labor leaders who might order a strike, because the prevention of strikes was not included as one of the purposes of the bill in its preamble.

Just before the bill was passed Senator Husting told the Senate that he was authorized by the Secretary of Labor to say that the administration and the Department of Justice do not construe this provision of the bill as prohibiting strikes and peaceful picketing and will not so construe the bill. Senator Newlands expressed the opinion that a contention might well be made that section 4 does limit and restrain the power to call strikes, but he said that if that was its effect the result would have been secured by indirection because Congress had refused to meet the question squarely by supporting bills he had introduced to prevent strikes of railroad operators contingent upon the creation of a tribunal for the adjustment of differences between employers and employees. The priority bill as passed by Congress contains a provision to prohibit some of the effects of a strike, but the prohibition is directed rather against the obstruction of interstate commerce than against calling a strike, and Senator Hollis in this case secured the adoption of his amendment that nothing in the bill should be construed to modify the effect of sections 6 and 20 of the Clayton law.

#### BILL TO REGULATE PRICES

While the War Industries Board of the Council of National Defense and the various government departments are wrestling with the question of prices of materials for the government and for the allies, efforts are being made in some quarters to attempt to bring about a reduction in prices to consumers other than the government. Senator Pomerene of Ohio has introduced a bill to provide for regulating the production, sale and distribution of iron ore, iron, steel and other products. It would give the President authority to fix prices for these products not only for the government and the allies, but for the private consumer as well. If prices cannot be agreed upon the President would be given power

to take over the mills and operate them. The President now has power to commandeer such plants for war purposes only.

#### WAR TAX BILL

In the revised war revenue bill now under consideration in the Senate, which increases the proposed income tax on corporations from 4 per cent, as originally proposed, to 6 per cent, the title of the proposed "excess profits" tax is changed to "war profits" tax. The rates of taxation on the excess of net income over that received in the pre-war years 1911, 1912 and 1913, a graduated scale ranging from 12 to 50 per cent, remain the same as in the Senate bill reported on June 28, but there are several changes in the language. For instance, Section 201 now includes the following: "For the purposes of this title all the trades and business in which a corporation or partnership is engaged shall be deemed to be a single trade or business, and all its income from whatever source derived shall be deemed to be received from such trade or business."

The original bill included provision for an exemption of 6 per cent in the case of corporations whose income was less than that amount during the pre-war period. This is omitted in the revised bill. Instead it is provided in Section 205 that if the Secretary of the Treasury upon complaint finds either that during the pre-war period the net return of any domestic corporation was low as compared with the net return during such period of representative corporations, partnerships and individuals engaged in like or similar trade or business, or that during the pre-war period the ratio between the net and gross income was substantially less than the like ratio in case of representative corporations engaged in similar business, then the war profits shall be the same proportion of the net income received during the calendar year as that of representative corporations engaged in similar business, the proportion to be determined by the Commissioner of Internal Revenue in accordance with regulations prescribed with the approval of the Secretary of the Treasury.

The 10 per cent tax on undistributed surplus is made to apply to the amount remaining undistributed six months after the end of the calendar year, deducting the amount actually invested and employed in the business or retained for employment in the reasonable requirements of the business.

#### BELGIUM NEEDS RAILWAY SUPPLIES

The special Belgian mission in the United States is understood to have outlined in a tentative way to officials of the United States government plans for securing large quantities of railway supplies and equipment from this country for rehabilitating the railway lines of Belgium at the first opportunity.

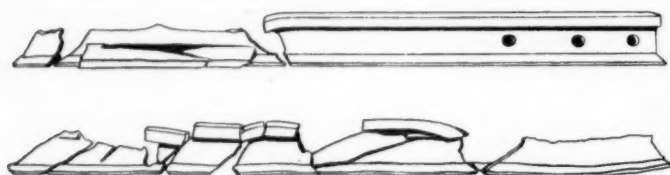
#### NATIONAL ARMY TO MOVE IN SEPTEMBER

Regulations to govern the call to the colors of the 687,000 men that will compose the new national army have been issued by Provost Marshal General Crowder. These call for the transportation first of 30 per cent of the number, or about 200,000, to the various training camps beginning on September 5. The next 30 per cent are to begin entraining on September 15, another 30 per cent on September 30, and the remaining 10 per cent will be mobilized as soon after that date as possible.

**LOW FARES FOR BRITISH MUNITION WORKERS.**—The Ministry of Munitions announces that, in order to facilitate the transfer of labor to important work, arrangements have now been made whereby working people proceeding to work of national importance on which they have been placed through an employment exchange or the Ministry of Labor will be provided with a railway warrant to enable them to travel at the rate of five-eighths of the ordinary fare in operation before January 1, that is, considerably less than half the present full fares.

## SEAMINESS AS A CAUSE OF RAIL FAILURES

H. W. Belnap, chief of the division of safety of the Interstate Commerce Commission, has issued a report of an investigation made by James E. Howard, engineer physicist, of the rail failure occurring on the Pennsylvania Railroad, Sodus Bay branch near Newark, N. Y., on February 16, 1917. The broken rail caused the derailment of a passenger train consisting of a locomotive and two cars traveling at the rate of 35 to 40 miles an hour. The rails were 60-lb. steel rails rolled by the Cambria Steel Company in 1887 and laid the same year. The ties were oak and pine 17 per panel, with tie plates on the pine ties. The broken rail was on the inside of a curve. There were no defects in the wheels



Assembled Fragments of the Broken Rail

or flanges of the derailed equipment to indicate any contributing cause for the accident. An abstract of Mr. Howard's report follows:

The type of fracture was a split head. Failure took place in the receiving half of its length. About three feet of the rail, at its immediate receiving end, remained intact. Beyond this part there was a broken section, 8 ft. 4 in. long, followed by an unbroken section, 18 ft. 8 in. long, completing the length of the rail, 30 ft. The unbroken section was locally bent at the time of the derailment. Forty-eight fragments of the broken section were recovered.

The appearance of some of the recovered fragments assembled in their relative places is shown in the drawing.

The top of the rail showed an increase in width of 0.18 in., as nearly as could be judged when the fragments were put together. This increased width corresponded substantially with the width of opening of the seam in the head, a relation generally found in splithead rails.

Lateral flow of the metal occurred in the shallow zone between the running surface of the head and the upper edge of the seam. The formation of a split head is attributed to the wedge action of the steel in this affected zone, reaching streaked metal, starting an incipient seam where the metal of the head in a crosswise direction is deficient in strength or in ductility, or both. The incipient seam gradually develops in length and in depth until there is complete separation of the head.

Seaminess of the steel was shown on polished and etched sections. Cross-sections of the rail showed these markings as dots and short lines; on a longitudinal section they appeared as streaks. Attention is called to the difference in the formation of these streaks in different parts of the rail. In the upper part of the head and the lower part of the base they are needle shaped, or acicular. In the web and at the junction of the web with the head and the base, these needlelike streaks are converted into seams of considerable width.

The longitudinal streaks are believed to have had a direct influence on the formation of the split head. Examples of split heads have been witnessed in different stages of development, and incipient seams have been found to coincide with and follow the paths of interior streaks. The quest for the primary cause of the presence of streaked metal leads back to the ingot. Efforts to introduce streaks by heat or mechanical means have been unsuccessful. Conversely, their removal by heat or mechanical means has not been accomplished. Sudden quenching of hot steel will cause the formation of thermal cracks, but such cracks are of a different order to the streaks

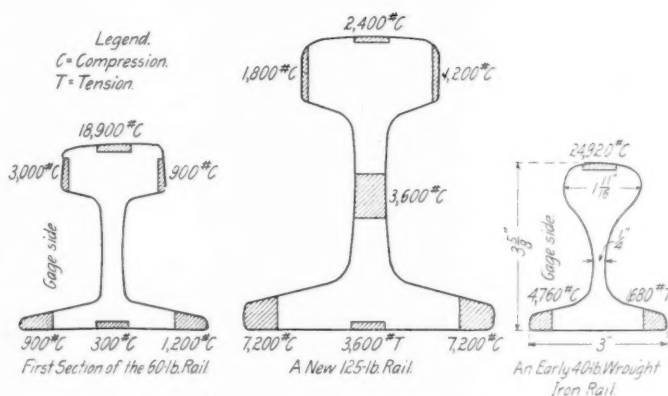
and seams under consideration. These are present in steel which has cooled slowly.

Mass segregation occurs in the cooling of ingots, shown in the chemical analysis of the metal. There are slag or other nonmetallic inclusions in different parts of the ingot and blowholes are also found. The large reduction in sectional area given the metal of the ingot orients these structural conditions and leads to the formation of longitudinal streaks in the rail. Lengthwise the rail this structural arrangement seldom affects its serviceability. In a crosswise direction, however, the character of the streak becomes an important factor, especially when service stresses approach the limit of endurance of the steel.

The streaks brought to view upon etching with tincture of iodine differ in their characteristics, each variety assuming greater or less importance, depending upon the severity of the service stresses. There are streaks which represent metal enriched in carbon; others in which ferrite predominates. In these streaks the continuity of the metal is not lost. The welding of blowholes may be partial, the efficiency of which in a degree depends upon the composition of the steel. The presence of slag is a barrier against welding and at such inclusions the continuity of the steel is interrupted.

Wheel pressures which cause lateral flow of the metal in the head of the rail differentiate the properties of these streaks. Whenever evidence is presented of permanent flow having taken place, the rail problem has evidently passed beyond the stage in which the elastic limit of the steel is a controlling factor. The rail is practically certain to fail in course of time, under a repetition of these overloads. The life of the rail may be prolonged or its type of failure changed by the elimination of streaks. It is highly desirable that structural soundness be attained as nearly as the art of steel making permits. A margin in strength should be maintained between working loads and the ultimate resistance of the rail in which structural soundness is an essential factor.

A number of rails of different weights and of more recent fabrication were examined in conjunction with the 60-lb. rail which caused the present derailment, and disclosed the prevalence of streakedness in some degree in all of them. A comparison of rails of early fabrication with those of current



Internal Strains in Different Kinds of Rails

manufacture is favorable for those which are being made at the present time.

Measurements were made of the internal strains in the rail which caused the present derailment, also those which were in other rails taken from the track. Service conditions introduce strains into all grades of steel, and of all weights and types of rails. The values of these strains amount to many thousand pounds per square inch, and they are permanently retained in the metal, in wrought iron as well as in steel. An old wrought-iron rail, which was examined, displayed the presence of strains which had probably been locked up in



the metal upward of 40 years. These internal strains may be modified by track conditions, and the state of internal strain of a rail, when properly interpreted, is a reliable index of what occurred in the track preceding the time of the examination.

The failure of the present rail was undoubtedly precipitated by the seamy state of the metal in the head. The steel was of medium hardness in respect to its chemical composition. Wheel loads had not distorted the general shape of the head except at the broken section.

Repeated impulses along different elements of the head, their paths varying according to the lines of contact made by wheels of different contours of treads, had effected a hardening of the surface metal covering a width of two inches.

Internal strains were introduced, amounting to many thousand pounds compression, measured in the direction of the length of the rail. Lateral flow had taken place in the metal next the top of the head, shown at the surface by a flattening of the grains, and necessarily exerting an effect on the interior metal. Under the influence of lateral flow, it is believed that an incipient crack was started in the interior of the head, this effect reaching some line of structural weakness, or place where the continuity was interrupted by a slag or other seam.

A measurable increase in the width of the head, in rails which have otherwise maintained their primitive shape, commonly signifies that a seam is in progress in the interior. Very soft rails may show increase in width without a split head necessarily being in process of development. The detection of a split head in the very earliest stage of its development does not appear feasible. In its more advanced stage the general increase in width of the head, or droop at the under side, or a discolored line along the running surface, are the recognized indications of the presence of a split head. By reason of the difficulties attending the detection of a split head before it has reached an advanced stage, and the possibility of error in judgment in interpreting the significance of the first visible indications, every effort should be made to eliminate the presence of streaks from the steel. The sequence of the passes in the rail mill, in the reduction of the bloom, is shown to be favorable in respect to the modification of the form of the streaks which are located in the different parts of the cross section of the finished rail.

A careful examination of the metal at different stages from the ingot to the finished rail is essential for a thorough exposition of the subject of streaks. Blowholes and shrinkage cavities disappear from view in the early passes of the blooming mill. Slag or other nonmetallic inclusions, found in globular form in the ingot, are drawn into acicular lines in the finished rail. These structural variations are frequently of such an order that the results of chemical analysis do not adequately indicate the state of the metal. Drillings for chemical analysis taken at a streak are so diluted by the surrounding metal that the characteristics of the streak are obscured. If the seaminess is due to an incompletely welded blowhole, structural rather than chemical manifestations should be looked for. Microscopic examination offers a promising method of test in this connection.

All rails are subjected to internal strains, which are not negligible factors, as the magnitude of their values indicates. If it were feasible to furnish rails initially free from internal strains they would not remain so. The cold rolling of the wheels in the track promptly introduces strains at the running surface of the head. No grade of steel has been examined which has resisted this action of the wheels.

In conclusion it appears: That the failure of the rail which led to the present derailment was caused by a split head;

That the split head resulted from a condition of streaked and seamy metal;

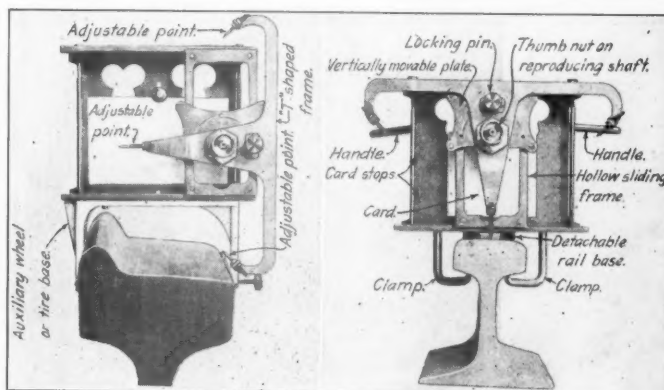
That ingot conditions were responsible for this streaky state;

That warning was given of the development of the fracture by a decided increase in the width of the head prior to the time of derailment; and that such warning called for the removal of the rail from the track.

### A RAIL AND TIRE CONTOUR RECORDER

A new machine for reproducing an accurate full-size cross-section of a rail head, car wheel or locomotive tire on a card or metal plate has been perfected by B. F. Deuel, Yonkers, N. Y., under the name of the Deuel rail and tire contour recorder.

The device is being used for taking rail sections by the New York Central and is also being tried out for use on tires. It consists of a metal frame on the face of which is attached a hollow frame which slides longitudinally, on which in turn is mounted a plate which moves vertically, both sliding on roller bearings. A T-shaped frame with adjustable points is secured to the plate by pivots and a reproducing shaft, actuated by a spring so arranged that the spring can be removed easily to permit the resharping of the lead or the insertion of a metal point passes through the center of the T-frame. Immediately above this shaft is a device, also operated by a spring, which locks the T-



Front and Back Views of the Device

frame upon the plate to retain any of its arms in an operative position. A grooved slide with a stop at one end insures cards or plates for tires being replaced in the same position when used again. In this way one card can be used for the entire life of a wheel or tire.

The rail base is detachable and is held in place by two clamps supported by springs. No special adjustments are necessary for different weights of rails as the instrument is held in place perpendicular to the rail while in use by clamps supported by springs which engage the under side of the rail. This arrangement permits the instrument to be attached or detached in a very short time. For use on tires the rail base is replaced by an auxiliary base which has two legs, one of which will engage in two punch marks previously made in the tire and which are also used for subsequent sections taken on the same tire. The other leg has a thumb screw which is set in the wear groove or a punch mark and holds the instrument in position on the tire.

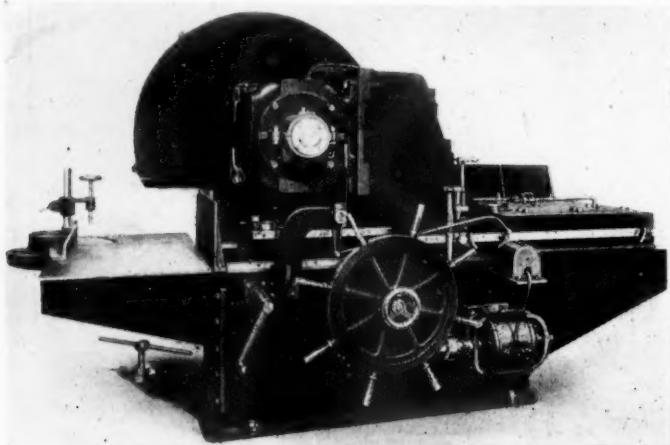
After the instrument is attached the card or plate is inserted in the groove and is kept from moving by tightening the thumb nut on the back of the card. One of the side arms of the T-frame is then brought in contact with the side of the rail or tire, first pulling out the locking pin above the reproducing shaft so as to rotate the T-frame to the desired position. The reproducing point is then released by a slight turn of the thumb nut which will permit the point to come in contact with the card or plate. The arm is then moved

downward, keeping it in contact with the rail or tire to the limit of the movement. After this the reproducing point is raised and, by giving it a slight turn, it is held away from the card which the T-frame is being revolved through 90 deg., bringing the center arm to the first point on the rail or tire. The reproducing point is then released as before and the arm moved across the top of the rail or tire. By revolving the T-frame 90 deg. more in the same direction the other side arm in the T-frame is brought into contact with the rail or tire and, after releasing the reproducing point, the instrument is again moved down to the limit, giving a full size reproduction of the rail head, car wheel or tire.

For rails a card or plate about  $3\frac{3}{4}$  in. square is required and the record obtained can be transferred to a tracing showing the original section and the worn area can thus be noted. The instrument weighs 6 lb. complete and can be carried in a traveling bag or a 4-in. by 9-in. by 11-in. case.

### A SAW FOR RAIL RECLAMATION

The advantage of sawing off the ends of rails released from tracks is becoming generally appreciated by railway officers. Several railroads have adopted the practice and others have the matter under consideration. More attention is being given to the reclamation of second-hand rails in order that the maximum service may be secured from them when relaid, because of the fact that rails on tangent tracks



The High Speed Friction Saw

are taken up largely on account of the characteristic battering of the heads near the ends of the rails and the wearing of the fishing surfaces. The economy of resawing is naturally dependent upon the efficiency with which it can be done.

The friction saw has been practically applied in some industries for about 10 years, but it is only within the last four years that it has been developed for the cutting of rails in reclamation work. In the friction saw the metal is melted or burned away by the heat generated through the friction of the rapidly moving saw blade against the metal of the piece being sawed. It has the advantage of extreme rapidity of action and economy in operation and maintenance. As the saw blades are without teeth they are much cheaper than the regular tooth saw and can be replaced at much smaller expense.

The saw machine shown in the illustration has a toothless blade 46 in. in diameter by  $\frac{1}{4}$  in. thick, direct connected to a 45-hp. electric motor. The saw and motor are mounted on a carriage propelled by a second motor of 1 hp. capacity attached to the side of the machine base. Through the movement of this carriage the saw is brought into contact with the rail and caused to follow through as the metal is cut away. When the operation is completed the carriage motor

is reversed and the saw is withdrawn. The entire outfit weighs less than 13,000 lb.

Another advantage of the machine is that the rail can be cut without need of clamping it into fixed position. As shown in the photograph the center line of the saw blade is mounted slightly above the rail section. Consequently the blade itself answers as a sort of automatic clamping device, forcing the rails hard against the retaining clamp attached to the table.

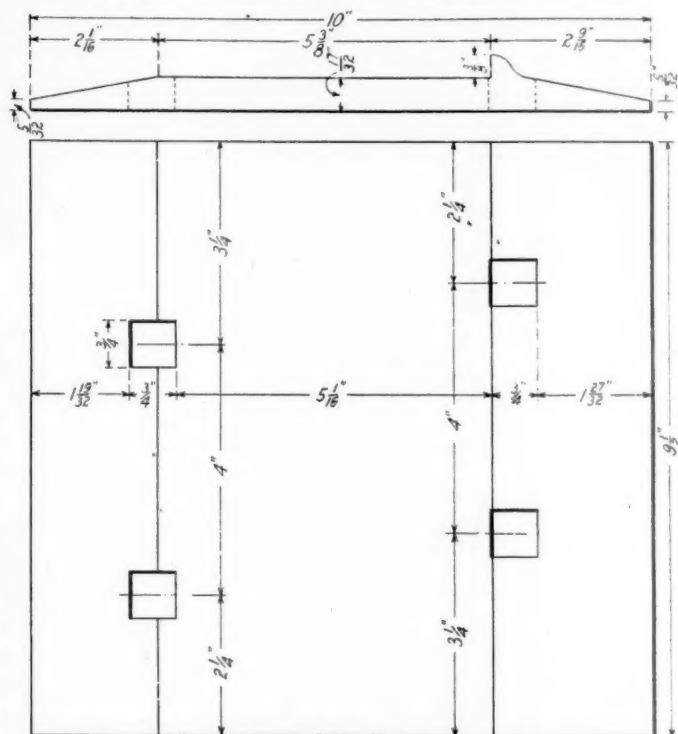
Installations of these saws at railway reclaiming plants include one at the rail mill of the Chicago & North Western at Boone, Ia., and one at the reclaiming shop of the Chicago Great Western at Oelwein, Ia. The saw at the Boone plant has been operated at a cost of \$0.54 per gross ton of rails handled, including the cost of unloading, cutting, drilling, reloading, and removal of the scrap. Rails of 72 lb. section have been cut off in 20 sec. and as many as 354 rails have been sawed in 10 hours. This high speed friction saw is manufactured by Joseph T. Ryerson & Son, Chicago, Ill.

### A HEAVY TIE PLATE

The drawing shows the details of a tie plate adopted by the Southern Pacific to secure the full advantage of larger size ties which were made standard on that road about two years ago. These ties are 7 in. by 10 in. by 8 ft. in size, it being the conclusion that this size would be more proportionate to the present day loads.

Prior to the change the standard tie for all service was 7 in. by 9 in. by 8 ft. With the adoption of the larger tie for main lines a 7-in. by 8-in. by 8-ft. tie was made standard for use on branch lines and sidings, these relative sizes conforming more nearly to the comparative service requirements. Eighteen ties are used per 33-ft. panel.

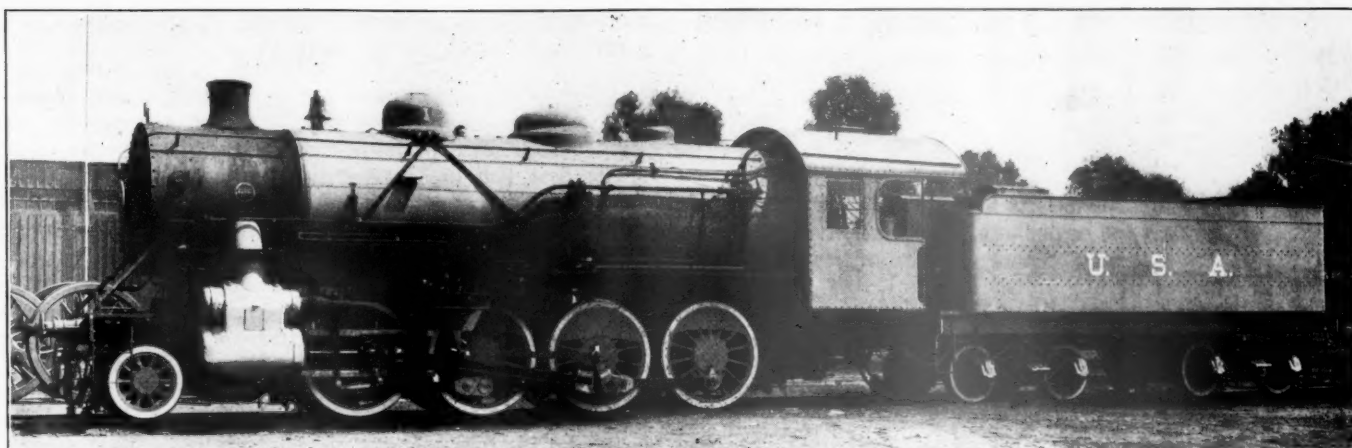
The new tie plate is  $9\frac{1}{2}$  in. by 10 in., giving 95 sq. in. of bearing area on the timber as compared with 70 in. with



Details of the Tie Plate

the plate formerly used. This tie plate is  $17/32$  in. thick and has a  $3/8$ -in. shoulder. It extends  $2\frac{19}{32}$  in. beyond the base of the rail on the shoulder side and  $2\frac{9}{32}$  in. beyond the base on the inside. It weighs 12.21 lb. The use of these larger plates has been found to decrease materially the tendency of the rail to "roll out" on curves.





*Locomotive No. 1, the First of 680 Consolidations for Service in France, Was Built in 20 Days*

## U. S. A. War Locomotive Completed in 20 Days

**This is the First Unit on Orders for 1064 Locomotives and 8997 Cars for U. S. Service in France**

**L**AST Saturday, just 20 working days after the order was placed, the Baldwin Locomotive Works completed the first locomotive on its order from the United States Government for 150 engines for service with the American troops in France. The contract was received July 18 and was given preference over all other work, either foreign or domestic. Speedy construction was also considerably facilitated by the similarity between these locomotives and the Consolidation locomotives which the Baldwin Locomotive Works have been building for the British War Office, the two locomotives being almost alike except that the American locomotives will have superheaters and the British have not. The Baldwin Locomotive Works is continuing its speedy work on these locomotives and will turn them out at the rate of four a day.

The locomotives are of standard gage; they weigh 166,400 lb. and will have a tractive effort of 35,700 lb. Their cost is said to be about \$43,000 each. The general dimensions follow:

Gage	4 ft. 8½ in.
Cylinders	21 in. by 28 in.
Driving wheels, diameter	56 in.
Total wheel base	23 ft. 8 in.
Driving wheel base	15 ft. 6 in.
Weight, total engine	166,400 lb.
Weight on drivers	150,000 lb.
Tractive effort	35,700 lb.
Boiler, diameter	70 in.
Boiler pressure	190 lb. per sq. in.
Number and diameter of tubes	5½ in., 26; 2 in., 165
Length of tubes	13 ft. 9 in.
Firebox	122 15/16 in. by 38¼ in.
Heating surface, firebox	181 sq. ft.
Heating surface, tubes	1,681 sq. ft.
Heating surface, total	1,862 sq. ft.
Superheating surface	420 sq. ft.
Grate area	32.7 sq. ft.
Tank capacity	5,400 U. S. gal.

The speed with which this first locomotive has been built, however, is only one sign of the aggressiveness being shown relative to equipping the railroad lines which our regiments of railway engineers will build behind the sectors to be held by the American troops in France. The War Department has thus far distributed orders for 150,000 tons of rails. On July 18 it placed orders for 300 large locomotives; early in the present week it ordered no less than 764 more locomotives, this making 1,064 in all, and 6,000 30-ton standard gage and 2,997 narrow or 600 mm. (1 ft. 11½ in.) gage freight cars, all for service with the troops in France.

The standard gage freight car order, as noted elsewhere in this issue, was distributed among five companies as follows:

1,200 low side gondola cars—Pressed Steel Car Company.

1,000 box and 300 tank cars—American Car & Foundry Company.

900 high side gondola and 800 box cars—Standard Steel Car Company.

600 flat and 300 refrigerator cars—Haskell & Barker Car Company.

900 box cars—Pullman Company.

These cars are all two-truck cars of 30-ton capacity, whereas the cars in general use on the railways in France are four-wheel cars of not more than 20-ton capacity.

The narrow gage cars were distributed thus:

500 flat cars and 100 trucks—Pressed Steel Car Company.

166 tank and 700 low side gondola cars—American Car & Foundry Company.

400 low side gondola cars—Ralston Steel Car Company.

400 low side gondola cars—Magor Car Company, and

666 box and 165 gondola cars—Standard Steel Car Company.

The original locomotive order for 300 locomotives was for standard gage 80-ton Consolidation locomotives and was divided evenly between the American Locomotive Company and the Baldwin Locomotive Works. The new order for 764 locomotives placed this week has been given entirely to the Baldwin Locomotive Works, and is especially interesting other than as to its size, because it includes a large amount of narrow gage equipment. The order includes 380 additional standard gage Consolidation locomotives; 195 600-mm. (1 ft. 11½ in.) gage Prairie type locomotives, 126 50-h.p., 600-mm. gage gasoline locomotives, and 63 30-h.p., 600-mm. gage gasoline locomotives. These orders will, of course, have preference over all other business.

Some people are under the impression that the order placed July 18 was the first order for locomotives ever placed by the United States Government. This is not the case. During the Civil War, Brigadier General D. C. McCallum, general manager of the United States Military Railroads in the Military Division of the Mississippi, had to purchase a large number of locomotives and cars for the Federal railways south of Nashville, Tenn. He acted under orders from Secretary of War Stanton, and found the railway supply industry on the job then just as he would find it now. "It is proper and just to state," he wrote, "that the requisitions of this order were met by all in a spirit of zealous patriotism. The manufacturers at once placed all their available force at work upon the engines and cars ordered, which were all completed and delivered in an unprecedented short time."

## WAR PRISONERS AS RAILROAD LABORERS

By Our Special European Correspondent.

When the armies of the United States in Europe begin to take prisoners in large numbers, it is not unlikely that they may be shipped to the United States and put to work there to lessen the labor problem created by the mobilization of the troops that captured them. At least this has been the method used so far by all the nations at war. The photograph is a typical picture that may be seen in Italy, in France, in England, or Russia, or any of the Central Empire countries. Here we see a handful of Austrian prisoners, some of the hundred and odd thousand taken by the Italians, at work near the new railroad which is to connect the port of Ostia, Rome's ancient seaport, with modern Rome.

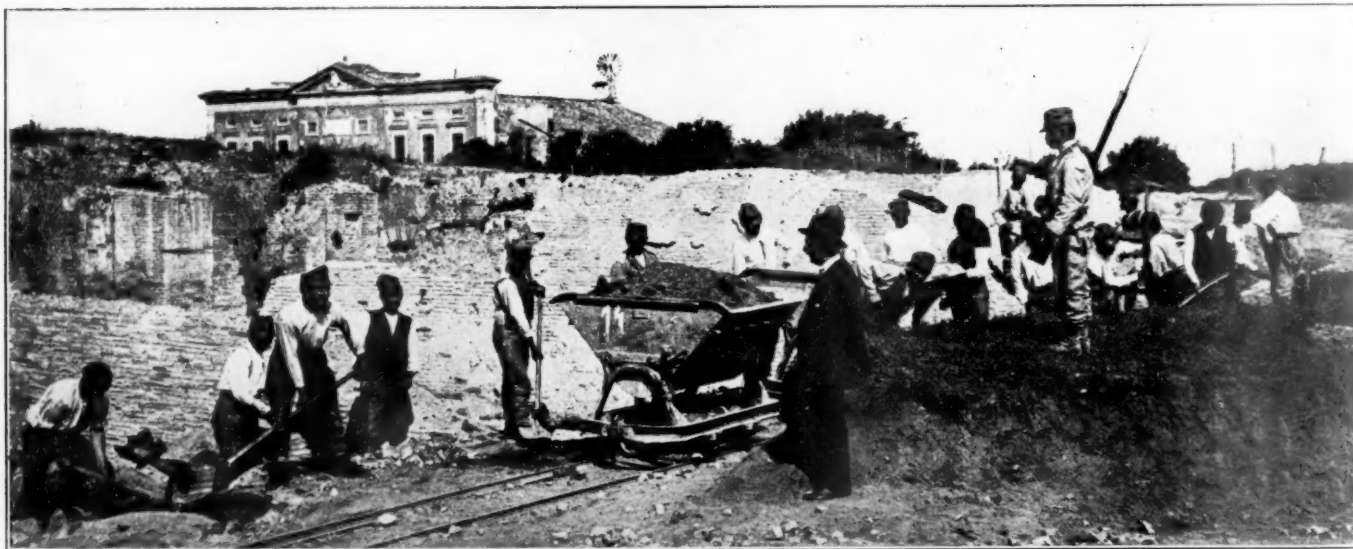
Thanks to these prisoners, work is being done that has been contemplated many years but which is only this year under full headway, and the city of Rome, which for a couple of thousand and more years was connected with the sea, some eighteen miles distant, by a road of stone, will soon have a road of steel. This new railroad is being built for the purpose of converting Ostia into a summer resort for the great mass of Rome's population which is too poor to ride to the more expensive and distant sea resorts.

The handling of prisoners in the beginning of the war was

## ALL IS NOT WELL WITH THE GERMAN RAILWAYS

"Germany's weak spots are . . . three—men, transport and Allies,"—the New York Times in a copyright cable despatch quotes a prominent Swiss manufacturer as saying: "The first two are intimately connected. Apart from the never-ending and gigantic drain of the armies, Germany has made colossal efforts to cope with the huge demand for war materials. By concentrating on a standardized pattern of their most useful weapon, the cannon, she has been able to reply to the allied artillery augmentation and still increase the output of other growing necessities, like grenades and machine guns. . . .

"But all this effort has been screwed up to the topmost notch. No further increase is possible, and even to attain that result sacrifices have been imperative. That is where the question of transport becomes important. Not only are the railroads—lines, sleepers, and roadbeds—in bad repair and short of men to operate them, but war material requirements have compelled the Germans to withdraw labor from the manufacture of new rolling stock. Men who have worked on the German railroads tell me they are often forced to put in 36 hours without relief, and with that be incessantly at grips with defective material. Of course, accidents are



Austrian Prisoners Building a Railroad at Ostia, Italy

a problem, at least for the Allies. The Germans and Austrians soon showed the way war prisoners should be handled by putting theirs to work. While the Allies have not resorted to the barbarous treatment of prisoners resorted to by the Central Empires, prisoners are now no longer treated as gentlemen of leisure. They are put to work, though given good food and a small wage to encourage them. Indeed, the majority of the prisoners prefer work to idleness. In Italy the prisoners are given work of the above description or in the fields.

In France prisoners have for two years been employed on the docks, on the repair of railroads, in the fields and in similar occupations.

The English have 58,000 prisoners in England and many more thousands employed with the army in France on railroad reconstruction work.

As many of these prisoners are only too glad to get free of the fighting and as many of them would be only too glad to get to the United States under any conditions, the prisoners of our armies will rejoice, as one might say, in an opportunity to lighten our labor problems.

common. They are increasing and there is no way out of the vicious circle.

"Just one illustration. Last winter Berlin had a coal famine, though Germany is one of the greatest coal producing nations, simply because it was impossible to rush coal trains to the city at the moment when water transport was blocked by ice."

### FORMER UNITED STATES VICE CONSUL'S STORY

"Considerable disintegration has taken place in the material organization of Germany as well as in her spiritual organization," says A. Curtis Roth, former United States vice-consul at Plauen, Germany, in an article in the Saturday Evening Post. "The German railroad systems not only have been greatly disorganized by war but have suffered a significant deterioration. It has been impossible to keep the roadbeds in repair, to replace the worn rails and switches, and to renew the rolling stock. The result is, the railroads are no longer the efficient roads they were at the outbreak of the war. The trains now are invariably from one to three or four hours late, and it is impossible to move troops today



on the schedules that prevailed in the early part of the war. This, of course, is a very real factor in the reduction of Germany's military efficiency.

"It has been impossible, too, to keep the great state roads—the Landstrassen—in repair. Those roads, which in former days were the envy of motorists from all parts of the world, are now worn deep with ruts and fretted with hollows. Thousands of Russian and French prisoners have been kept at work upon these roads; but, so heavy have been the traffic requirements of the armies at the front, it has not been possible to keep pace with the amount of repair work necessary.

Superior means for communication has been a prime necessity in German strategy, and it is the deterioration of her state roads and railroads that has, to a great degree, lamed the striking power of her armies.

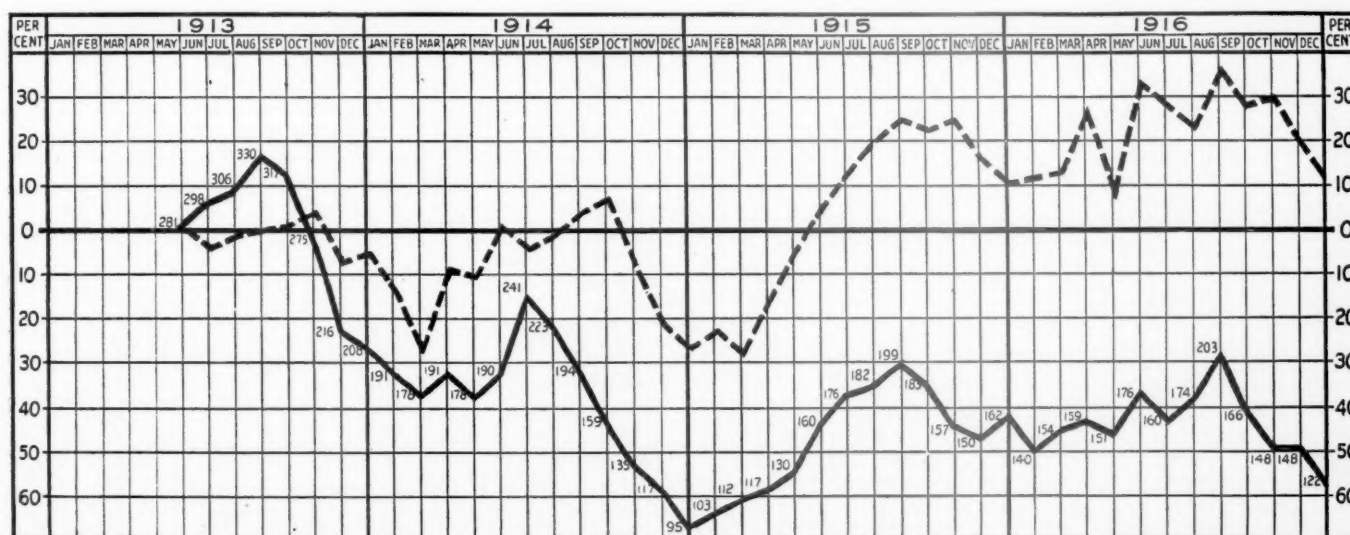
#### NEW EQUIPMENT HARD TO OBTAIN

Some extremely interesting figures regarding the operating difficulties of the Prussian railways were recently given in the *Journal des Transports* of Paris. It appears that at

#### SAFETY ON THE NORFOLK & WESTERN

The Norfolk & Western has had no train accident within five years in which any passenger was killed; and in this time the number of passengers carried has been about 34 millions. Since May, 1913, when the "safety-first" movement was begun on this road, there has also been a marked improvement in the record of safety of employees, and the progress in this respect is indicated by the diagram showing the increase, or decrease, month by month, in the total number of injuries to employees; and on the same diagram there is shown in the broken line the increase in the volume of freight traffic, measured in ton-miles, during the same time. The lines of the diagram, starting together in May, 1913, were, at the end of last December, 69 per cent apart.

Another record has been made up for the years 1912 to 1916, inclusive, showing the reduction in the number of employees killed on duty, as compared with the volume of freight traffic. Compared with 1912, the increases in traffic, year by year, were, in ton-miles, (1913) 10 per cent, (1914) 5 per cent, (1915) 22 per cent and (1916) 42 per cent; while the employees killed, all causes, as compared with



Injuries to Employees on the Norfolk & Western as Compared with Fluctuation of Business. Percentage Based on May, 1913

the end of 1915, out of 25,176 locomotives, as many as 4,300 were being employed either in allied or invaded territory, while at the same time 30 per cent of the total locomotive stock was undergoing repair. This is said to be due, not to the heavy traffic, but to the bad quality of the materials used, which are largely "substitutes" for those normally employed. New rolling-stock is also being built at a lower rate, due partly to higher prices, and while 27,728 cars were bought in 1915, the total for last year was only 22,267.

Compared with last year, the cost of locomotives has risen by 40 per cent and that of freight cars by 26 per cent, and on the authority of the Secretary of the Essen Chamber of Commerce there will be further increases of 25 and 20 per cent, respectively, on the locomotives and freight cars to be delivered this winter. The same person has also complained that too many railwaymen have been mobilized. The total number called now amounts to 200,000, and while 80,000 women and 20,000 prisoners have partially replaced them, these substitutes are too badly fed to be good employees, and three prisoners are said to do the work of only two ordinary men. Another difficulty is that the more territory occupied by Germany, the more she has been obliged to send her rolling-stock away for long distances, with the result that the increased mileage run decreases the stock available.

1912, decreased 23 per cent, 41 per cent, 41 per cent and 49 per cent. There was a somewhat smaller decrease in the number of employees injured.

**A JUDGMENT OF SOLOMON.**—A study of what the French call the "divers facts" recorded in the daily press reveals many little incidents and dramas of railway interest. For instance, there is the recent case of the Birmingham soldier's wife, who, when fined at Willesden for traveling on the London & North Western Railway with intent to defraud, informed the magistrate that she had never been in a train before. We can easily understand the magistrate's incredulity. However, he had an easier task than the judge who was lately asked to award \$2000 damages against the Bavarian State Railways in respect of "loss of beauty" by a 17-year-old governess. Plaintiff's face had suffered contact with a carriage door, causing the loss of several teeth and other blemishes, and she therefore sought to convince the court, not only that she was not pretty, but that her chances of marriage were diminished. After a lengthy hearing, and evidence by "three expert connoisseurs of female beauty," the young woman was awarded her \$2000, plus a monthly solatium of \$30 until she married, in which event her "diminished eligibility" would cease to have any but an academic interest.—*Railway Gazette, London.*

## General News Department

The Santa Fe has addressed a circular letter to employees who have to do with the handling of freight traffic, urging them to put forth every effort to conserve freight equipment and prevent loss of and damage to freight shipments.

The Union Pacific has issued a booklet containing information of interest to those who have relatives who have been called to the colors. The booklet gives answers to more than a thousand questions regarding the location of the new army training camps and other matter concerning the various branches of the service.

The lumber committee of the Council of National Defense has reported that, with a slight improvement in the supply of empty cars being furnished to the sawmills getting out lumber for the cantonments and camps, a better movement resulted. Up to August 4, of the 12,220 cars originally ordered for the cantonments, 11,675 cars, or 95.45 per cent, had been shipped.

To facilitate the transportation of laborers employed at the Great Lakes Naval Training Station, Great Lakes, Ill., the Chicago & North Western is running three special trains to the camp each morning and three returning in the evening. The company transports approximately 3,000 skilled and unskilled laborers, bricklayers, carpenters, etc., to and from the station each day.

The Indiana committee on information for the Railroads' War Board has announced the following officers: H. F. Houghton, general agent of the Cleveland, Cincinnati, Chicago & St. Louis, chairman; Joseph F. Hall, general passenger agent of the Lake Erie & Western, and J. H. Baumgartner, publicity agent of the Baltimore & Ohio Southwestern, members of the executive committee.

The State Public Service Commission of Washington has adopted a resolution setting forth that in its opinion the erection of new stations and the elimination of grade crossings is work that can be deferred until after the war, or for some time at least. In the resolution the commission also favors the curtailment of passenger service so that the men and money may be used in other lines.

A section gang of women has just been put to work on the main line of the Lehigh Valley. Nine women, working under the direction of an experienced foreman, comprise the gang, which operates on the west end of the Buffalo division near this city. The women are performing all the regular duties of similar gangs of men, tightening bolts, putting in new ties, and tamping ballast. Pneumatic ballast tampers are used by the Lehigh Valley.

The American Defense Society has asked the railroads of the country to run "food instruction" trains to aid the movement for the conservation of food. Letters have also been sent to the mayors of various cities and the heads of the state councils of defense in various states urging them to take up the question with the railroads in their home territory. It is pointed out in the letter that extraordinary success has resulted from a similar movement by the Long Island. Each train, according to the plan, would be manned by speakers and demonstrators working under the state and local committees in co-operation with the railroads.

Officials of the Pennsylvania Lines West at Ft. Wayne, Ind., have felt that, due to the shortage of common labor, it might be necessary for them to endeavor to use women for light labor, and also on the light machine tools and such other work as they may be expected to handle. No facilities have been provided as yet to make possible the employment of women, but the road proposes to install the necessary toilets and rest-rooms at once, so that they will be ready should the emergency arise. No steps have been taken for the adoption of a standard uniform for women, such as the Pennsylvania Lines East of Pittsburgh are now supplying their women workers.

The Interstate Commerce Commission has issued a supplement to its rules governing the classification of steam railway

employees, providing that until further order, railways may be relieved from the requirement of recording and reporting the number of hours on duty of the following classes of employees: M. W. & S. foremen, section foremen, gang and other foremen—M. E. department, electricians, employees in outside agencies, other traffic employees, crossing flagmen and gatemen, draw-bridge operators, other transportation employees, and all other employees. Instead they may record and report the number of days served by these classes of employees.

Attorney General McGhee and the State Public Utilities Commission of Ohio have been investigating reports that the Toledo & Ohio Central and the Hocking Valley have been selling coal cars to the Canadian government. The Attorney General has stated that he is ready to take action to prevent any cars owned by Ohio railroads from being sold for use in another state or country, inasmuch as the railroads, in their demand to the Public Utilities Commission for authority to increase freight rates, have urged as a reason for such increases the need of getting more money with which to get additional rolling stock. The Hocking Valley has denied that the company sold any cars recently, and stated that the last sale of cars made was over three years ago.

The Missouri Pacific has sent out a card addressed to its patrons, officers and employees, thanking them for their co-operation in helping to reduce the car shortage by loading cars to capacity, and moving and releasing them promptly. An appeal is made for still greater co-operation, and it is pointed out that two tons more in each car would equal 200,000 more cars. The company asks any persons having suggestions on the subject to send them to the road's officers, who will be very glad to receive them. On the reverse side of the card there is an illustration of a freight car and a copy of a poem entitled "Who Am I," reproduced from the St. Louis Furniture News. The poem deals with the greatly increased importance of the freight car, and contains an appeal to speed up the handling of the cars.

President Earling of the Chicago, Milwaukee & St. Paul has issued an appeal to the loyalty and patriotism of the employees of the company to "do his or her utmost to render the maximum of service, in not only promoting operating efficiency, but also in promoting military efficiency and bringing nearer the dawn of peace." The appeal calls upon all men who are handling the trains to reduce the consumption of coal, fuel, oil or lubricating oil; to avoid delays in stations and promote the prompt and careful handling of passengers and baggage. It calls upon the yard crews to increase the number of cars handled, and to reduce the damage to cars; station agents are urged to reduce the detention of cars and secure increased loading thereof. Detailed suggestions as to the best means of accomplishing results will be put forth by the officers of the company in charge of the several departments.

### Thirty-four Dead in Italian Wreck

Press despatches report that 34 persons were killed and 100 injured in the derailling of the Genoa-Milan express at Arquata on August 6.

### Highway Crossing Gates Ordered Closed After Midnight

After August 22 the late returning automobilist will have to wake the crossing watchman before he can cross a railroad track inside the limits of New York City. The New York Public Service for the First district has adopted an order directing the New York Central, the Long Island and the Staten Island Rapid Transit to keep the gates at 145 highway crossings closed between midnight and 5 a. m. as a measure of protection to vehicle traffic. The order will take effect on August 22, and was favored by the railroads and the city police department. It was brought out at the hearings that it had been found extremely difficult to keep the crossing watchmen awake and on the job.



### 19 Killed and 50 Injured in Trolley Accident

Nineteen people were killed, including one who died the following day, and between 40 and 50 injured, when two electric cars collided head on, late the afternoon of August 13, at North Branford, twelve miles east of New Haven on the Shore Line Electric Railway. Both cars were crowded. The accident was probably caused by the crew of the westbound car which, according to orders, should have waited on a siding less than a half-mile from the spot where the accident occurred. Instead it kept on, the crew for some unexplained reason planning to reach the next switch. It later developed also that the dead man's handle on the westbound car had been fastened down so that it would be inoperative. The motorman and conductor of the westbound car escaped injury, but the motorman of the eastbound car was killed. Approaching a sharp curve the car crashed into the eastbound car from New Haven. The force of the impact telescoped the cars fully half their length.

### Discontinue the Valuation!

There has long been a question in many minds as to the practical wisdom of the valuation of the railroads by the government. The task will require so long a time that values are certain to be materially altered before the great task is completed. . . . Now that nine regiments of railway engineers are to be sent to France, why not abandon the valuation of American railways for the period of the war? Railway employees of the highest character, experience and skill have been commandeered, as it were, for the government valuation. These are just the type of men needed for the rehabilitation of the French railways. This nation can't afford to send tyros to do the work in our sister republic. We must send the best we have. Why not divert the amount appropriated by Congress for valuation to the equipment and maintenance of engineer regiments?—*Cincinnati Enquirer*.

### New York Commission Will Originate Legislation

The New York Public Service Commission for the First district has announced a plan for "drafting legislation in the open." The law under which it was created explicitly authorizes the commission to recommend legislation as to corporations and matters within its jurisdiction, and provides that the commission may hold hearings and take testimony in respect to any matter of legislation. This method the commission proposes to apply to the formulation of future legislation amending the public service commission's law, the railroad law, the transportation corporation's law and other statutes affecting public service corporations and their rates and service. Corporations will be invited to submit their legislative proposals in advance for scrutiny. Individuals interested in the perfecting of legislation will be also invited to follow the same course. Every company under the jurisdiction of the commission has been invited to participate, and hearings will begin on Wednesday, August 15, 1917.

### Privilege vs. Right as Applied to Passes

The Erie has joined those roads who are asking their employees traveling on passes not to hold their seats while paying passengers are standing. "An employee using a pass," says the notice to the Erie employees, "is enjoying a privilege of transportation. A passenger holding a ticket has paid for a right of transportation, which must be regarded as in every way superior."

"Under war conditions trains will, at times, unavoidably be crowded. It may not always be possible to give every passenger a seat, but certainly none should stand while railroad employees of either sex, holding passes, are seated. The obligation of an employee in such a case is plain and rests upon the principles of courtesy and right."

"The success of the railroads in coping with the great burdens which the war is laying upon them depends very largely upon their ability to retain the confidence and win the co-operation of the public."

"Every employee who shows courtesy and consideration helps toward this end; every one who fails in these respects hinders it."

"Here is a chance to help!"

### The Pennsylvania's Frank Thomson Scholarships

John Morrow Daniels, of Freeport, Pa., and Eugene F. Dawson, of Columbus, Ohio, have been awarded the Frank Thomson scholarships for 1917.

Mr. Daniels, who was awarded the scholarship for the Lines East, is 20 years old, and has been a student at Kiskiminetas Springs School, Saltsburg, Pa. He will enter the University of Pennsylvania next fall, in the engineering department. He is the son of J. J. Daniels, assistant trainmaster, Conemaugh division, Freeport, Pa.

Mr. Dawson, the recipient of the Lines West scholarship, is 21 years old, and is a graduate of the North High School, Columbus, Ohio. He intends to enter the engineering department of the Ohio State University. He is the son of William E. Dawson, passenger car builder, Pennsylvania Lines' Shops, Columbus, Ohio.

The Frank Thomson scholarships were established in 1907 by the children of the late Frank Thomson, formerly president of the Pennsylvania Railroad, as a memorial to their father. The purpose of the scholarships is to enable sons of living or deceased employees of the Pennsylvania System to obtain technical educations, and so fit themselves for the service of the railroad. Two scholarships are awarded each year, upon competitive examinations; one goes to a son of an employee of the Lines West, and the other to a son of an employee of the Lines East of Pittsburgh.

### Carry Home Your Purchases

Governor Whitman of New York has issued a proclamation to the people of that state in which he says:

"Men are needed for productive labor. They must be reserved for such work and not drawn therefrom to do non-essentials. If you will show due consideration, your dealer will be able to supply men for productive fields, instead of withdrawing them therefrom. The needless delivery work that you put upon stores means an unnecessary drain on the country's man power."

"At the request of the Editorial Conference, representing the leading business newspapers, I desire to point out that every shopper can be patriotic in five ways:

"By carrying parcels home whenever possible;

"Accept without complaint less prompt deliveries in war time;

"Do not demand special deliveries;

"Avoid having goods sent home unless you are sure you are going to keep them;

"Bring back to the store such goods as are portable when return cannot be avoided."

"The stores will give you the best service in their power, but both the stores and the public must do their duty to the country."

"As governor of the state of New York, I ask the public to do these things for the welfare of our country during the war."

The *Railway Age Gazette* and the other papers published by the Simmons-Boardman Publishing Company are members of the Editorial Conference mentioned in the proclamation.

### One Way to Save Meat

President Harrison, of the Southern Railway System, has issued a statement calling attention to the fact that one of the ways in which a very substantial saving of our meat resources may be made is through reducing the number of animals killed on railroad tracks. On the railroads of the United States many thousands of cattle and hogs are killed every year, and, as those killed in this way are not used for food, this loss results in a correspondingly large decrease in our available meat supply.

"The responsibility for this loss rests primarily on the owner of the animals who allow them to stray on the railroad right of way," says Mr. Harrison. "When they are killed the law places the responsibility on the railroad and the owner suffers no direct pecuniary loss. There is, however, in addition to the serious reduction of the meat supply of the country, a further economic loss through the payment by the railroad of money, which is urgently needed at this time for increasing the transportation facilities of the country, the lack of which for the movement of his products to market may cause a loss to the farmer greater than the amount he received for the animals killed on the rail-

road. The extent of this loss may be indicated by the fact that the Southern Railway System alone paid out in the 12 months ended June 30, 1917, more than \$200,000 for animals killed on the right of way. This sum, even at the present high prices of equipment, would be sufficient to buy more than 100 standard box cars capable of handling at a single load more than 3,000 tons of freight, and the constant use of these many additional cars would tend to the relief of the present war-time congestion of traffic. Is it not the patriotic duty of every farmer to keep his live stock away from the railroad tracks?"

General Agent J. S. Rockwell, of the Buffalo, Rochester & Pittsburgh, speaking along the same line, says that, "In the face of a threatened food shortage, it becomes more than ever important that farmers along the railroad tracks should keep their gates closed to prevent live stock from straying out on the tracks and being struck by the first train that comes along. Cattle killed in this manner are usually rendered unfit for food, and the result is a total loss as far as helping feed the nation and winning the war is concerned. On a recent inspection, an officer of the Buffalo, Rochester & Pittsburgh observed that 33 out of 82 gates on the Buffalo & Rochester divisions had been left open. Carelessness in not closing gates renders useless all precautions and safeguards placed to keep animals off the tracks, and results in large numbers of them being killed yearly.

"It can be said without prejudice, if the fences maintained by the property owners were kept in as good a state of repair as are the right of way fences maintained by the railway companies, one of the frequent causes of cattle getting on the track would be eliminated to a considerable degree. It often happens that cattle placed in a field where a railroad company's fence is perfectly secure and the gate closed, will wander into the adjoining pasture through the poor fence between, and then, because the gate to that field has been left open, the animals finally get onto the tracks and frequently are killed."

#### Department of Commerce Urges Use of Waterways

Secretary Redfield of the Department of Commerce has issued a statement calling attention to the importance of making use of navigable waterways in every manner possible to the end of lessening the burden of traffic upon our railroads, because the latter are now carrying a volume of tonnage unparalleled in history, and further imperative demands are going to be made upon them.

"Not only is it patriotic in communities and individuals to endeavor to lessen pressure upon our railways," the secretary said, "but it is economic common sense. Our waterways are a tremendous asset which each community can realize on largely. This can be done in the main, at small expense; and in this work the Department of Commerce and the Shipping Board stand ready to aid wherever possible. The wisdom of preparing now will be demonstrated later; and that municipality or district, foresighted enough to take steps to use these water highways, will reap abundant substantial benefits, aside from the merit of having co-operated with the efforts being made to lessen the burdens on the railroads. This latter is no less than a patriotic duty.

"According to a report by the Storage Committee of the General Munitions Board, in certain of the belligerent countries in Europe, the railroads are available for general commercial traffic only one day in seven. This is an indication of what may, in some measure, be expected here when we get into the full swing of this war work. By diverting all unnecessary burdens, in the utilization of our abundant waterways, we should be in vastly better position, and commerce generally should not feel the lack of transportation, inevitable if these waterways are not made use of. The government will thus be facilitated in its colossal task of moving enormous numbers of men, enormous amounts of necessary equipment, baggage, horses, stores, material, munitions, foodstuffs and freight for export.

"The Department of Commerce is endeavoring to help these waterside communities make use of the means at hand. Its work is handicapped to some extent at present by lack of force and facilities; however, Congress has been asked for a small appropriation in order that this assistance may be carried forward energetically. Doubtless the funds will be allowed, as no more important piece of interior development work of a creative nature can at this time be seen. Meanwhile, any community interested, or individuals or groups of individuals, with plans for

using inland waterways are requested to write the particulars to the Department of Commerce, and wherever possible, hearty and energetic co-operation and assistance will be rendered."

#### Increased Efficiency in Car Loading

A report made public by the Chicago, Burlington & Quincy shows that that system has effected an increase of 28 per cent in average tons per loaded car for the month of June, 1917, compared with June, 1916. The road handled an average of 29.38 tons per car in June, 1917, and 22.98 tons per car in June, 1916, an increase of 6.4 tons per car. This increase in average loading represents a saving of 46,622 cars for the month.

H. E. Byram, vice-president, in charge of operation, in commenting upon the figures says that "the increase in car efficiency has not been due entirely to the efforts of the Burlington's management and its employees, but a large part of the credit for the increased loading of cars is due to the co-operation on the part of the shippers along the line. To a remarkable degree our shippers have exhibited a sense of appreciation of what the Burlington, in common with other systems, is attempting to do in furnishing the greatest possible volume of transportation with the amount of equipment that is available. The practical effect of this co-operation is clearly shown by the large number of cars made available for other purposes as a result of loading cars more nearly to capacity."

This same spirit of co-operation appears to have developed generally in the last few months throughout the United States, though not always to the same extent as shown by the Burlington's record. Reports from roads having a mileage of 173,000 miles, and handling about 80 per cent of the total traffic, show an average of 25.8 tons per loaded car in May, 1916, and of 27.2 tons in May, 1917, an increase of 1.4 tons per car, or 5.4 per cent. In the eastern and southern districts the average increase for the same period was 1.5 tons, or 5.5 per cent, and in the western district there was the same increase in tons per car, but the per cent of increase was 6.4. Many individual roads in central territory have made good records in April, 1917, compared with April, 1916. The Chicago & Eastern Illinois increased its tonnage per loaded car from 25.5 tons to 31.4 tons, or 23.1 per cent; the Lake Erie & Western from 18.7 tons to 23.6 tons, or 26 per cent; the Chicago & Alton from 21.6 tons to 26.3 tons, or 21.8 per cent; the Chicago & Erie from 23.3 tons to 26.2 tons, or 12.4 per cent; the Atchison, Topeka & Santa Fe from 19 tons to 21.3 tons, or 12.1 per cent.

It is evident that the spirit of co-operation on the part of the railroads and shippers, which has been so strongly urged by the Railroad's War Board, is producing a beneficial effect in securing the loading of cars to capacity, and thereby accomplishing the same results that would follow the placing of many thousands of additional cars in service, without the additional congestion that more cars in service might produce.

#### Efforts to Increase Coal Shipments to Northwest

Representatives of coal operators, all dock companies on Lake Michigan and Lake Superior, the railroads, and the Interstate Commerce Commission held a conference at Washington on August 14, at the call of F. S. Peabody, chairman of the committee on coal production of the Council of National Defense, to consider ways of meeting the urgent necessity of increasing shipments of coal via the lakes to the northwest. It was estimated that it would be necessary to ship a total of 29,000,000 tons of soft coal from Lake Erie ports during the season of navigation, whereas only 12,000,000 tons had been moved up to August 11, leaving 17,000,000 tons to be shipped in the 16 weeks remaining before navigation closes, or an average of 1,062,000 tons a week. Shipments to date have averaged only 940,000 tons a week.

After an all day discussion as to the reasons for the condition, and as to how the situation could be remedied in order to avoid a fuel famine this winter, resolutions were adopted expressing the sense of the meeting that unless peremptory orders are issued from some authoritative source to all coal operators in the Pittsburgh, Fairmont and No. 8, Ohio, districts that they must ship 50 per cent of the cars (except cars for railroad fuel) furnished to their mines daily to Lake Erie ports for transshipment to the northwest until further notice, or until the present emergency is met, the situation in the northwest next winter will amount to a calamity. This resolution was referred to



Daniel Willard, chairman of the advisory commission of the Council of National Defense; the members of the Division of Car Service of the Interstate Commerce Commission, and C. M. Scheaffer, chairman of the Commission on Car Service, who were present, to attempt to secure the necessary authority. It was the thought of those present that a priority order to be issued under the authority given to the President in the priority bill, which has just become a law, would meet the situation. The resolution also suggested that the method of car distribution now applied to railroad fuel coal should be adopted.

There was considerable discussion as to whether the reason for the shortage of shipments to the northwest was caused by car shortage or by a preference on the part of coal operators to ship elsewhere. It was stated that railroad shipments placed in vessels on Lake Erie ports up to August 1 of this year had amounted to about 11,000,000 tons, as compared with 13,000,000 tons for the same period last year, the shortage being caused by the fact that the season of navigation began late this year. It was also shown that a considerable amount of coal had been shipped into Canada. The Railroads' War Board had recently requested the coal operators to use 50 per cent of their car supply for shipments to the lake ports, but this measure had proved ineffective because there was no authority to enforce the request on the shippers. It was declared that the situation in the northwest presents the most immediate pressing necessity, and should be given first consideration because other districts may be taken care of after the season of navigation by rail shipments. The New England situation was to be taken up at a similar meeting later.

#### Signal Appliance Association Meeting

It has been the practice for years to hold the annual meeting of the Signal Appliance Association at the same time and place as the annual meeting of the Railway Signal Association, but in order to co-operate fully with the latter body this year, the annual meeting was held at the Hotel McAlpin, New York, N. Y., on August 10. The R. S. A. annual meeting at Atlantic City next month will, on account of war conditions, be confined to a two days' business session, all forms of entertainment having been eliminated.

Secretary-Treasurer Edmunds reported an active membership of 52 companies; and that the association purchased last June a \$1,000 Liberty bond. Further action was taken authorizing the purchase of an additional \$500 bond in the next Liberty Loan.

At the meeting a resolution relating to official attendance was offered and unanimously adopted, to the effect that "this association shall have no official representation at Atlantic City during the time of the annual meeting of the Railway Signal Association, September 18 and 19, 1917."

While this resolution refers to "official representation" only, the spirit and practice of that resolution rightfully construed should prevent all attendance by railway supply men on their own individual responsibility. It is certain that none of the many representatives interviewed by this publication will attend the convention. The only justification for any representative is for those engineers who have been actively participating in committee discussions be on hand to discuss the subject when it is presented on the floor of the convention. The Signal Appliance Association expressly desired the full co-operation of its members in this respect.

The new officers of the association are: W. T. Kyle, Page Woven Wire Fence Company, chairman; George C. Isbester, Rail Joint Company, vice-chairman; F. W. Edmunds, Dressel Railway Lamp Works, secretary-treasurer. Mr. Isbester was continued as vice-chairman this year on account of his now being the paymaster in the United States Army. New members of the executive committee are: Sidney Johnson, General Railway Signal Company; H. G. Thompson, Edison Storage Battery Company; A. S. Anderson, Adams & Westlake Company; and C. F. Massey, C. F. Massey & Co.

Chairman Kyle has appointed the following arrangement committee: J. Warren Young, chairman, Kerite Insulated Wire & Cable Company; J. W. White, General Railway Signal Company; J. F. Lepreau, Thomas A. Edison, Inc.; A. S. Anderson, Adams & Westlake Company; W. R. Young, General Railway Signal Company. Place committee: Henry Lee, chairman, Railway Signal Engineer, and G. A. Blackmore, Union Switch & Signal Company.

## MEETINGS AND CONVENTIONS

*The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.*

- AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York. Next meeting, October 16-17, St. Louis.
- AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, Chicago.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Next meeting, September 26, Congress Hotel, Chicago.
- ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Supt. of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting to have been held September 18, 1917, Washington, D. C., indefinitely postponed.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.
- CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 568 Union Arcade Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENT'S ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.
- INVESTMENT BANKERS' ASSOCIATION OF AMERICA.—Frederick R. Fenton, 11 W. Monroe St., Chicago. Annual convention, October 1-3, 1917, Baltimore, Md.
- MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.
- MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, Chicago.
- NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Jas. B. Walker, 120 Broadway, New York City. Next annual convention, October 16, 1917, Washington, D. C.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PACIFIC RAILWAY CLUB.—W. S. Wollner, Assistant to Chief Engineer, Northwestern Pacific R. R., San Francisco, Cal.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial Annex Hotel, Pittsburgh.
- RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, office of the president's assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.
- RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.
- RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next annual convention, September 18-19, 1917, Hotel Traymore, Atlantic City, N. J.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.
- TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Ag't, Erie R. R., 1924 Oliver Bldg., Pittsburgh, Pa. Meetings bi-monthly, Pittsburgh.
- UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

## REVENUES AND EXPENSES OF RAILWAYS

SIX MONTHS OF CALENDAR YEAR, 1917

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses				Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) in income last year.	
		Freight.	Passenger.	Total.	Way and structures.	Equipment.	Traffic.	Miscellaneous.					
Lehigh & Hudson River.....	96	\$982,328	\$22,734	\$1,005,062	\$161,762	\$161,762	\$9,141	\$423,612	\$29,033	\$730,344	\$33,600	\$342,428	—\$45,628
Lehigh & New England.....	296	1,623,110	8,287	1,700,000	267,575	267,575	15,162	514,372	53,015	1,070,973	59,010	570,026	—1,219,797
Lehigh Valley.....	1,443	21,258,290	2,115,888	23,374,178	2,846,528	4,536,972	503,164	11,146,061	585,448	19,718,163	1,028,500	4,687,887	—1,233,495
Long Island.....	397	2,111,669	4,013,353	7,063,908	938,564	866,295	64,897	3,296,863	56,924	5,446,168	1,617,740	1,170,144	—287,233
Los Angeles & Salt Lake.....	1,154	4,138,769	1,641,127	5,779,896	668,354	892,132	197,356	1,796,748	120,590	3,785,676	334,234	2,178,856	148,497
Louisiana & Arkansas.....	302	563,106	106,672	669,778	131,466	123,941	23,235	223,906	26,218	327,495	61,018	106,855	—104,551
Louisiana Ry. & Nav. Co.....	342	855,518	136,499	992,017	185,940	147,392	39,548	41,268	41,539	811,594	273,350	175,743	—21,220
Louisiana Western.....	208	1,129,374	424,663	1,554,037	165,000	144,948	47,678	374,129	11,559	44,798	90,400	719,857	322,992
Louisville, Henderson & St. Louis.....	199	772,765	210,146	982,911	135,711	120,877	29,230	34,133	21,576	630,530	386,588	361,359	—104,904
Maine Central.....	1,216	4,630,151	1,632,939	6,263,090	748,338	955,879	69,002	3,113,331	11,352	169,028	5,066,013	1,406,215	—148,497
Michigan Central.....	1,862	16,588,518	5,517,376	22,105,894	2,734,601	3,792,543	399,696	1,266,187	382,469	19,059,815	968,000	4,909,577	—1,526,479
Midland Valley.....	385	999,597	272,732	1,272,329	313,196	178,529	17,819	432,316	50,157	1,001,019	421,856	30,827	76,002
Minneapolis & St. Louis.....	1,647	3,923,247	863,072	4,786,319	751,280	548,921	106,557	2,162,348	512	330,315	1,437,481	1,71,425	—263,517
Minn., St. Paul & S. S. Marie.....	4,228	11,693,685	3,007,839	14,701,524	1,721,247	2,309,600	297,104	5,980,507	100,121	749,639	664,959	4,583,822	—1,701,392
Missouri & North Arkansas.....	365	443,365	188,773	632,138	123,208	107,224	23,776	261,074	31,311	543,341	139,188	109,034	—119,470
Missouri, Kansas & Texas System.....	3,865	13,695,813	4,471,772	18,167,585	3,629,056	3,767,080	397,856	7,316,781	608,913	15,854,483	28,800	2,955,233	1,878,822
Missouri, Oklahoma & Gulf.....	332	730,498	126,330	856,828	119,688	161,016	26,206	47,811	44,391	770,318	86,664	141,375	—141,375
Mobile & Ohio.....	1,160	5,573,429	704,499	6,277,928	642,284	699,100	1,474,348	226,333	283,462	3,804,581	239,422	1,520,053	—58,421
Monongahela.....	108	957,216	69,218	1,026,434	178,046	82,943	5,373	294,662	24,546	585,572	36,000	426,305	—60,421
Monongahela Connecting.....	6	.....	.....	.....	181,953	140,029	2,079	449,694	23,571	797,326	190,673	179,382	79,617
Morgan's La. & Tex. R. R. & S. Co.....	401	2,273,325	680,999	2,954,324	327,281	463,345	72,295	915,897	75,871	1,867,323	1,300,811	189,786	651,124
Nashville, Chattanooga & St. Louis.....	1,237	4,980,199	1,495,410	6,475,609	721,293	1,376,779	333,447	2,711,382	216,990	5,436,014	1,679,663	140,000	110,962
New Orleans & North Eastern.....	204	1,715,621	367,336	2,082,957	2,294,876	4,251,001	63,975	718,854	65,902	1,520,812	774,064	184,300	628,639
New Orleans Great Northern.....	285	624,845	160,935	785,780	85,710	141,094	18,378	256,948	40,075	543,480	290,199	252,665	—175,301
New Orleans, Texas & Mexico.....	191	500,772	137,705	638,477	104,306	97,381	29,310	192,073	39,070	462,139	8,400	193,757	—175,301
New York, Chicago & St. Louis.....	571	7,225,965	609,448	7,835,413	677,288	1,219,858	270,762	4,096,553	28,734	199,996	6,491,306	1,395,101	—582,300
New York, New Haven & Hartford.....	1,997	20,206,163	15,461,684	35,667,847	3,885,648	5,645,126	259,023	17,586,110	611,939	1,175,178	29,155,979	10,319,297	1,659,990
New York, Ontario & Western.....	568	2,860,336	556,128	3,416,464	4,109,637	742,119	51,793	1,763,681	117,462	3,111,282	998,355	863,028	55,525
New York, Philadelphia & Norfolk.....	112	1,972,129	298,820	2,270,949	278,786	483,301	28,430	994,390	73,592	1,893,674	583,716	91,044	—278,848
New York, Susquehanna & Western.....	135	1,270,177	290,569	1,560,746	135,522	195,031	12,403	934,595	34,203	1,310,864	438,215	97,000	—93,372
Norfolk & Western.....	2,085	26,890,758	2,809,075	29,700,833	2,926,320	5,803,093	391,323	9,415,599	575,287	19,123,838	11,678,101	1,463,000	—1,659,990
Norfolk Southern.....	908	2,008,111	524,248	2,532,359	339,710	405,838	52,370	892,409	120,426	1,811,310	880,197	90,090	46,188
Norfolk Pacific.....	6,514	31,768,488	6,930,259	38,698,747	5,602,637	4,678,241	624,599	13,276,369	611,164	25,015,366	17,133,058	14,211,695	1,252,315
Northwestern Pacific.....	507	989,923	878,321	1,868,244	365,734	274,844	32,975	772,877	5,386	64,546	1,513,487	98,541	9,109
Panhandle & Santa Fe.....	670	2,623,113	511,777	3,134,890	479,101	570,169	27,770	909,750	75,792	2,040,880	1,123,731	1,115,815	95,758
Pennsylvania Company.....	1,754	26,363,488	6,293,746	32,657,234	4,448,516	7,040,536	511,697	16,827,518	274,907	936,631	6,468,350	2,178,831	—5,204,404
Pennsylvania Railroad.....	4,536	86,976,055	23,393,073	110,369,128	15,214,454	25,396,526	1,291,412	49,171,894	1,934,305	3,133,071	96,106,119	21,476,576	—1,751,016
Peoria & Pekin Union.....	19	85,112	35,445	120,557	66,742	82,929	203	372,647	141,963	3,995,193	48,288	787	—88,060
Pierre Marquette.....	2,250	4,502,665	992,242	5,494,907	739,256	643,073	119,356	2,338,310	15,037	141,963	3,995,193	1,983,489	614,544
Philadelphia, Baltimore & Washington.....	718	7,247,117	5,919,861	13,166,978	1,908,194	2,886,677	174,441	6,267,580	352,397	11,574,267	3,034,230	427,409	—281,348
Pittsburgh & Lake Erie.....	224	9,669,505	1,042,120	10,711,625	1,441,935	2,353,423	95,793	3,776,157	235,499	7,922,986	3,913,657	511,200	—2,131,518
Pittsburgh, Cincinnati, Chic. & St. L.....	2,399	25,293,360	6,305,833	31,599,193	3,906,235	7,211,680	596,365	14,571,101	866,695	27,424,305	8,230,458	1,398,805	393,323
Richmond, Fredericksburg & Potomac.....	88	1,235,660	579,703	1,815,363	192,041	242,963	23,035	787,312	26,994	50,991	1,423,935	77,875	105,639
Rutland.....	468	1,196,397	572,853	1,769,250	265,357	353,006	57,226	878,481	48,229	1,609,272	454,667	346,809	—140,660
St. Joseph & Grand Island.....	258	978,868	144,596	1,123,464	399,315	132,321	22,685	1,010,932	31,595	1,010,377	183,522	130,360	—64,332
St. Louis, Brownsville & Mexico.....	548	1,113,805	731,574	1,845,379	297,332	234,516	60,774	580,982	64,161	1,217,896	707,096	48,000	501,540
St. Louis, Merchants' Bridge Terminal.....	9	.....	.....	.....	177,179	101,038	5,703	773,720	46,798	1,084,439	408,301	45,288	64,666
St. Louis, San Francisco & Texas.....	190	375,867	141,432	517,299	103,870	104,275	13,273	277,812	37,033	536,263	32,090	23,135	—48,526
San Antonio & Aransas Pass.....	727	1,219,293	414,272	1,633,565	383,425	320,268	42,616	905,973	84,577	1,732,793	44,565	90,000	—45,917
Seaboard.....	3,461	10,241,044	3,277,018	13,518,062	1,596,376	2,362,980	481,877	5,451,472	115,301	10,391,223	4,645,098	3,985,440	95,471
Southern.....	6,983	28,142,499	9,444,789	37,587,288	4,467,043	6,804,660	1,027,208	14,414,709	1,100,461	27,942,594	13,511,962	11,676,675	864,119
Southern in Mississippi.....	278	346,525	164,315	510,840	118,739	49,706	13,159	251,991	26,528	460,121	103,956	61,699	6,136
Southern Pacific.....	7,079	45,322,215	15,313,571	60,635,786	6,657,428	9,073,791	1,075,500	23,522,069	1,633,772	42,802,448	23,558,719	20,288,460	3,743,221
Spokane, Portland & Seattle.....	555	2,180,048	723,850	2,903,898	363,858	259,031	45,753	705,776	26,874	1,480,877	1,635,387	1,286,881	687,532
Tennessee Central.....	294	606,647	184,305	790,952	137,736	135,075	29,443	318,543	44,430	667,214	187,193	158,377	9,494



## Traffic News

In order to prevent a threatened fuel famine in Utah and Idaho, the railroads entering Utah have agreed to divert cars to the coal mines.

The receivers of the Tennessee Central announce that on request of the War Board they have discontinued the operation of four week-day passenger trains, making a reduction of 180 train miles per day.

A joint session of the public utilities boards of Ohio, Illinois and Indiana has been called for August 23, at Indianapolis, Ind., to consider the request of the railroads for an increase of 15 cents a ton in intrastate rates on coal and coke.

The New York Central has withdrawn passenger tariffs filed with the New York Public Service Commission, proposing increases in rates between points in New York state. As noted in last week's issue, the commission for the first district suspended the tariffs from September 1 to September 20, and had planned to hold hearings on August 15.

The State Railroad Commission of Iowa has announced that the hearing of the shippers' side of the railroad petition for a 15 per cent increase in the intrastate freight rate on coal and coal products will be held on Tuesday, August 14, at Des Moines, Iowa. The case of the railroads petitioning for the increase was heard by the commission on August 2. All roads operating in Iowa were represented at the hearing.

Bryan Snyder, receiver of the Marshall & East Texas, announces that after August 14 that road will accept no freight or passengers for transportation over that portion of the line from West Marshall, Tex., westward to Winnsboro, 72 miles. This action is taken pursuant to a decree of the United States District Court issued July 17. This order leaves in operation that portion of the road from West Marshall, eastward, 19 miles, to Elysian Fields.

The State Railroad and Warehouse Commission of Minnesota has undertaken a special inquiry into the freight car situation, with a view to sending out a special appeal to railroads and shippers, and attempting to avert shortages as much as possible. The commission points out that there are indications that the federal officials will use the government authority to designate car preferences for the prompt movement of military equipment, grain and other similar shipments, and that such a condition will aggravate the present situation.

The Pere Marquette, in order to promote the conservation of cars and to expedite the handling of l. c. l. business, has adopted a "sailing-day" plan at Chicago, to go into effect on August 15. The schedule of the company is as follows: Mondays and Thursdays, Big Rapids, Mich.; Harbor Beach, Lake View, Midland, Manistee, Mt. Pleasant and Nawaygo; Tuesdays and Fridays, Elkton, Freeport, Ionia, Lake Odessa, Sparta, White Cloud and Laporte; Wednesdays and Saturdays, Belding, Toledo, Baldwin, Saginaw, Weidman, Portland and Alma. The road will continue daily l. c. l. service to Grand Rapids, Flint, North Flint and Detroit.

A conference between the Chicago sub-committee of the Railroads' War Board and the Chicago regional committee of the National Industrial Traffic League, was held at Chicago on August 10. H. E. Byram, vice-president of the Burlington, is chairman of the sub-committee, and C. I. Forsyth is vice-chairman. F. B. Montgomery, vice-president of the International Harvester Company, is chairman of the Chicago regional committee of the National Industrial Traffic League, and Robert C. Ross, traffic manager of the Ryerson Company, is vice-chairman. The league committee represents all the large shipping interests of the Chicago district. Plans were adopted at the meeting for complete co-operation between the railways and the shipping interests, and the committee aims to secure the utmost efficiency in the use of railway equipment moving within, into and out of the Chicago district.

The Chicago sub-committee of the War Board will meet every Tuesday morning, and an arrangement has been made under which the regional committee of the National Industrial Traffic League will always have representatives to meet with it. The

committee of the Industrial Traffic League will meet regularly probably once every fortnight, and these meetings will be attended by representatives of the railroads. The subjects discussed at the last meeting were those of earlier closing of freight houses; sailing-days for package freight cars; the pooling of box cars in the Chicago switching district and increases in the minimum weight of trap and ferry cars. No action was taken on any of these subjects, but they will be taken up for definite action at later conferences.

### "Buy an Upper Berth—You'll Like It"

Western roads have adopted this slogan as a war measure intended to avoid the necessity of hauling two half loaded cars instead of one filled to capacity. The lines point out that necessity demands the full use of every bit of railroad equipment in the country, and that the upper berth is just as desirable; in fact more so than the lower. The arguments put forward in favor of using an upper, are that the upper berth is 20 per cent less expensive, the ventilation is excellent, the occupant is further removed from the noise of the wheels, and he is out of the way of people moving up and down the aisles. The Pullman Company is supplying new buffer stops and individual curtains, which are designed to make the upper berth more attractive.

### Louisiana Roads Ordered to Increase Equipment

By an order of the Louisiana Railroad Commission dated July 26 the railroads of Louisiana must secure additional open top cars for shippers in that state.

On March 21, on account of numerous complaints, the commission declared that in its opinion, the railroads of the state were not furnishing sufficient freight equipment to handle the traffic properly and promptly at all seasons of the year, and decided to enter into an investigation. In accordance with the terms of the order a full investigation was made at a session at Baton Rouge, La., on July 16 and 19. It developed at this hearing that the shippers of the state were undergoing severe hardships, and that large industries were about to close on account of the failure to receive proper equipment for transporting their products. The commission decided that in its opinion arrangements can be made by the carriers to place in service more equipment in the shape of open top cars, and that this should be done without delay. By the order of the commission the Texas & Pacific, Morgan's Louisiana & Texas, the New Orleans, Texas & Mexico, the Missouri Pacific and the Louisiana Western, must each secure within 90 days from the date of the order 200 additional open top cars to be placed in service for the transportation of intrastate freight. The Chicago, Rock Island & Pacific, the Louisiana & Arkansas, and the Vicksburg, Shreveport & Pacific, must in the same period secure 100 additional open top cars each.

### Car Shortage Again Reduced

Reports just received by the Railroads' War Board show that the railroads of the country, in their co-operative efforts to give to the country the greatest possible amount of freight service, have effected an extraordinary improvement in freight car supply. The excess of unfilled car requisitions over idle cars, or what is ordinarily but inaccurately termed "car shortage," was less than one-fourth as great on August 1, 1917, as on May 1, 1917. The excess of unfilled car requisitions on May 1 was 148,627; on June 1 it was 106,649; on July 1 it was 77,682, and on August 1 it had been reduced to 33,776.

This result has been accomplished at a time when the railroads are supplying from 15 to 20 per cent more freight service with the same number of cars than was being given this time last year, for the railroads handled in July a tremendous increase in both government and commercial traffic. The movement of cantonment supplies alone occupied the full services of more than 30,000 cars. There was also an extraordinarily heavy demand for cars to transport food products, as well as materials to and from munition factories.

"The result above achieved has been accomplished by co-operation with the railroads of shippers, regulating bodies and the public generally," says Chairman Harrison of the Railroad War Board. "This co-operation has made possible the intensive loading of freight cars, prompter unloading, the elimination of a large amount of unnecessary passenger train service, and an opportunity generally to utilize the railroad plant efficiently.

The aim of the railroads at the present time is to put each car to the greatest possible use, to have empty cars placed where they are most needed, to prevent over-lapping and unnecessary service—in other words, to make the entire railroad system of the United States the most effective possible transportation agency in winning this war."

#### **New Haven Embargo Distinguishes Between Cars Loaded to Capacity**

The New York, New Haven & Hartford on Friday last put into effect an extensive embargo on carload freight for New England from connecting railway carriers via all junction points, from coastwise steamship lines via Harlem river, New York, piers 31 to 70 East river, New York, Brooklyn terminals and lighter service, except the following freight when loaded to the "marked carrying or practical carrying capacity of the car" consigned to stations on its own lines:

"Perishable and live stock, foodstuffs for human consumption, food for live stock, news and book print paper, copper, spelter, zinc, lead, crucible, billets, insect repellents, vermin exterminators, fungicides, tree and other agricultural spray material, baskets, barrels and fruit containers for shipping fruit and produce, coal, coke, hemp, sisal, tin cans, glass containers, materials and supplies for the New York, New Haven & Hartford, Central New England and Boston & Maine."

Embargo is also placed on less than carload freight except perishables. The embargo also excepts shipments for the United States or the allied governments or for the Red Cross.

#### **Roads in Central Department Plan Further Reduction in Passenger Service**

Extensive reductions in passenger train service in addition to those already made are soon to go into effect in the Central territory. According to a report made by R. H. Aishton, president of the Chicago & North Western, and chairman of the Central Department Committee, the railroads in this territory have effected a saving at the rate of almost 7,000,000 passenger miles a year in passenger train service between March 1 and July 15. The total reductions already made, and those which will soon be put into effect in this territory amount to over 12,000,000 passenger miles. This is in addition to reductions of over 16,000,000 passenger miles previously reported in eastern territory. The states included in the Central Department are Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, West Virginia, Wisconsin and Colorado. The reductions already made will effect the saving of approximately 500,000 tons of coal a year, which, by this reduction, is made available for other purposes, and the further reduction to be made will bring the amount of the saving up to about 840,000 tons.

Of the roads which, by reason of the extent of their service, have been enabled to contribute most largely to this result in the Central territory are the Pennsylvania, 835,756 passenger miles; Cleveland, Cincinnati, Chicago & St. Louis, 779,560; Chesapeake & Ohio, 725,510; Baltimore & Ohio, 601,987; Missouri, Kansas & Texas, 580,206; Pere Marquette, 574,629; Erie, 325,782; Chicago, St. Paul, Minneapolis & Omaha, 310,048; and Chicago, Rock Island & Pacific, 298,006. Several of the roads which have up to the present time made only small reductions in passenger service are contemplating larger reductions to take place in the immediate future. These include the Chicago, Burlington & Quincy, 1,800,000 passenger miles; the Chicago, Rock Island & Pacific, 886,456; the Missouri Pacific, 1,000,000; and the Missouri, Kansas & Texas, 598,822. The Chicago & Eastern Illinois, the Grand Rapids & Indiana, the Kansas City Southern, the Lake Erie & Western, the Michigan Central and the Minneapolis, St. Paul & Sault Ste. Marie, several of which have already made considerable reductions, are planning further reductions amounting to from 130,000 to 200,000 passenger miles each. The total amount of additional reduction already planned amount to 5,539,561 passenger miles, making a total of 12,227,963 passenger miles for the railways of the Central Department. The whole matter of curtailment of passenger train service has been carefully worked out by the committee and the railroads, and most of the further reductions are expected to be brought about by lengthening the schedule of transcontinental trains, and the effect will therefore be felt locally only to a small extent.

## **Commission and Court News**

### **INTERSTATE COMMERCE COMMISSION**

The commission has made public the tentative report of Attorney-Examiner Watkins in the case involving the adjustment of class rates in the southwest resulting from a general readjustment, including many advances made by the railroads in rates to bring them into conformity with the rates in Texas allowed by the Interstate Commerce Commission in the Shreveport rate case, in place of rates formerly made by the Texas Railroad Commission, which the carriers asserted had unduly reduced rates to points outside of Texas. The tentative report finds that the proposed increases in class rates between points in Texas and points in Oklahoma between Shreveport, La., and certain points in Oklahoma on interstate traffic between points in Oklahoma and between points in Kansas and the Panhandle of Texas are not justified. It is also recommended that the tariffs now under suspension until December 1 shall be ordered cancelled without prejudice to the filing of tariffs to conform with the findings of the report.

#### **Conference Rulings**

The commission has adopted the following conference rulings: "That employees of common carriers who enter the military or naval service of the United States in the present war, and who are carried on the records of the carrier as furloughed employees, to be restored to the carrier's service at the termination of the war, are furloughed employees within the meaning of section 1 of the act to regulate commerce, and that the carriers may lawfully grant free passes to dependent members of their families."

"A carrier may not lawfully build a switch track inside the plant boundary of an industrial company without adequate compensation therefor. And an agreement by the industry to give the carrier all or a part of its traffic as compensation for the building of the track is not regarded as 'adequate compensation.'"

"That the act to regulate commerce, as amended, does not authorize an express company subject to the act to carry property either for its own officers or employees or for the officers and employees of other common carriers except at its legally published rates."

### **STATE COMMISSIONS**

The New York Public Service Commission, First district, has refused permission to the Long Island to put into effect an increase in its mileage book rates from \$10 to \$11.25 for a 500-mile book, pending the decision of the commission upon a number of rate increases proposed by the company, and now under consideration by the commission. The new rate has been allowed by the commission for the Second district to apply outside of New York City, but the commission for the First district objected to the railroad's putting the new rate into effect in New York City. The railroad protested against having to sell separate mileage books for use wholly in New York City, and the present decision is not final.

### **COURT NEWS**

#### **Expense of Transportation**

A trunk line railroad, the Illinois Central, entered into a contract with a tap line railroad, the Kentwood & Eastern, whereby the K. & E. should receive part of the freight rate paid on lumber made from logs brought over the tap line and transported by the trunk line into a designated territory. The trunk line entered into a contract for the purchase of lumber from a lumber company whose mill was situated at the point of intersection of the trunk line and the tap line. Logs out of which lumber was made were hauled over the tap line, and the trunk line, on carrying such lumber into the designated territory, made the required payment to the tap line company, which amounts were in turn paid to the lumber company. The lumber company sold the lumber f. o. b. at the intersection point. In an action by the



trunk line company against the lumber company and the tap line company, the Circuit Court of Appeals, Fifth Circuit, held that though the trunk line, by reason of the diversity of its business and multiplicity of departments, did not immediately discover the situation, it was (the lumber company having agreed to deliver the lumber f. o. b. at the point of intersection) entitled to repayment of the sums paid the tap line company, for otherwise the lumber company would escape payment of a large portion of the freight on the logs to the point of intersection.—*Illinois Central v. Brooks-Scanlon Co.*, 241 Fed., 445. Decided April 11, 1917.

#### Carriage of Alcohol

A druggist by an action of detinue sought to obtain from a railroad possession of a shipment of alcohol to carry it to his place of business, where he was engaged in the sale of beverages, to keep and use it there in the manufacture of extracts in violation of the Alabama statute. The Alabama Court of Appeals holds that the railroad could not deliver the alcohol to the plaintiff without violating the criminal law, nor could the plaintiff accept delivery without a like result, so that the plaintiff, not being entitled to immediate delivery, was not entitled to recover in detinue.—*L. & N. v. Parish (Ala.)*, 75 So., 638. Decided May 29, 1917.

#### Freight Rates—Routing

The Minnesota Supreme Court holds that a carrier, in the absence of shipping instructions, is not bound to route shipments on an intrastate line to secure a lower rate for a shipper, where an easier grade and a shorter distance call for an interstate route, though as to a car which by mistake was routed on an intrastate line, it would be required to refund under the Minnesota maximum freight rate statute of 1913. In this case, not only the easier grade and shorter distance called for the interstate route, but the intrastate route would have involved a back haul of 15 miles, which, it was held, could not in reason be demanded.—*Comstock F. El. Co. v. Great Northern (Minn.)*, 163 N. W., 280. Decided June 22, 1917.

#### Insufficient Evidence of Negligence in Handling Live Stock

In an action against a railroad for damages to horses and mules resulting from alleged negligence in handling a carload of them, the evidence showed that the animals were not physically injured, but were in apparently good condition when delivered to the consignee, that in stockyards from which the animals were shipped a contagious disease similar to that contracted by them was discovered before they were put there, that live stock shipped from North to South in that season frequently suffer from shipping cold, and that several days after the plaintiff received them several animals developed colds, followed by pneumonia and died; but it was not shown that this condition resulted from the railroad's negligence. The Mississippi Supreme Court holds that a verdict for the plaintiff was wrong, and judgment for the plaintiff was reversed and the case dismissed.—*Illinois Central v. Ainsworth (Miss.)*, 75 So., 755. Decided June 25, 1917.

#### Order to Construct New Station Held Unreasonable

The Missouri Supreme Court holds unreasonable and unlawful an order of the Public Service Commission requiring the Wabash to construct a new passenger station at Macon for the following reasons: The evidence did not tend to prove any defect or inadequacy which could not be corrected by repairs, improvements and enlargement of the existing depot. There was no evidence that it was physically impossible or even difficult to make the changes necessary to meet the objections made to the existing structure. It did not appear that there was any legal obstacle to the changes proposed. There was no evidence tending to show that the company's right of way was too narrow to accommodate the improvements desired and necessary, or that the enlargement of the building and widening of the platform would in any way infringe on any street or interfere with any other property.—*State ex rel. Wabash v. Public Service Commission (Mo.)*, 196 S. W., 369. Decided June 1, 1917.

#### Construction of Safety Appliance Acts

The Louisiana Supreme Court holds that the federal Safety Appliance Acts absolutely require handholds above footboards, and railroads will not be permitted to substitute for them uncoupling or operative levers. The acts embrace all locomotives, cars and similar vehicles used on any railroad which is a highway of interstate commerce.—*Lenree v. Texas & Pacific (La.)*, 73 So., 676. Decided June 11, 1917.

#### Assumption of Risk by Employees on Tracks

The Kentucky Court of Appeals holds that employees of a railroad in the habit of using the company's tracks in coming to and going from its offices in doing their work, assume the risk of injury from passing trains. One having intermittent employment as a flagman was injured when leaving an office in the railroad yards which were without a municipality. A small number of employees visited the office daily, but their numbers were not so great as to charge the company with knowledge of their presence. The court holds that such employee was at best a mere licensee in the technical sense of the term, and hence, as the company was under no duty to maintain a lookout for him, it was not liable.—*Illinois Central v. Pierce (Ky.)*, 194 S. W., 534. Decided May 8, 1917.

#### Invalids as Passengers

A regulation of a railroad company provided that sick or injured persons on cots or stretchers, accompanied by an attendant, might ride in the baggage car on orders from the superintendent. A paralytic, obliged to use an invalid's chair, bought a round trip ticket and rode in the baggage car in his chair to his destination without having obtained a permit from the superintendent. On his return he was not allowed to ride in the baggage car and sued for damages. He had made similar trips five or six times a year for ten years, but had obtained a permit only twice. The Court of Civil Appeals holds that the fact that he had been so allowed to ride was an accommodation merely which could be discontinued at any time, and to the continuance of which the plaintiff had no legal right.—*M. K. & T. v. Nelson (Tex.)*, 195 S. W., 1,176. Decided June 15, 1917.

#### Carriage of Intoxicating Liquor

The Alabama Supreme Court holds that a carrier which has lawfully assumed the delivery of an interstate shipment of liquor, authorized by Ala. Act, January 27, 1915, may intervene in a seizure thereof under Act January 23, 1915, as a "person claiming any right, title or interest" therein. The provision of the former act, prohibiting possession at any one time of more than a certain quantity of liquor by any person or corporation, does not apply to an interstate carrier, the act permitting the importation of liquor in such quantity to every adult citizen. The latter act, declaring it unlawful to receive liquor for storage, distribution, or on consignment for another, or to maintain a warehouse therefor, does not apply to a carrier holding for delivery an interstate shipment of liquor authorized by the former act.—*State v. Pensacola, St. A. & Gulf S. S. Co. (Ala.)*, 75 So., 892. Decided May 31, 1917.

#### Passing Trains at Stations

A railroad had a rule reading: "Trains must use caution in passing a train receiving and discharging passengers at a station, and must not pass between it and the platform at which the passengers are being received or discharged." The Indiana Appellate Court holds, in an action for wrongful death of a person crossing tracks at a station, that the railroad's violation of the rule was not negligent *per se*, but proper as an item of evidence tending to show the degree of care recognized by the road as ordinary care under the conditions specified in the rule. It was held that the rule applied to a station having a station and platform on one side of double tracks and a cinder platform on the other with a walkway across the tracks. The tracks were curved to the east and west of the station, and passed through deep cuts, so that the view of approaching trains was obstructed. It was held to be the duty of the road's servants running a train to use reasonable care to ascertain if another train was at the station, discharging passengers, and if so, under the common law as well as the rule, to have used such reason-

able care as might be necessary for the protection of any person lawfully using the track at the station at the time. What constitutes reasonable care in such a case was held to depend on the circumstances, and may require constant lookout, after the place of possible danger is visible, the giving of warning signals, reduction of speed, or even stopping the train, in order to discharge the duty imposed.

The person killed was a farmer who had gone to the station to ship a case of eggs and remained to receive a milk can he was expecting. The train bringing the milk can was standing at the cinder platform side (on which the passengers alighted and crossed over around the end of the train). The deceased went on the other track, and was waiting for that train, which was about to pull out, to pass, when he was struck and killed. The trial court directed a verdict for the defendant; this was reversed on appeal. It was held that deceased was not a trespasser, though he was bound to exercise reasonable care for his own safety, commensurate with the dangers of which he had either actual or constructive notice, and that the question of his contributory negligence should have been submitted to the jury.—*Smith v. Cleveland, C. C. & St. L. (Ind.)*, 115 N. E., 603. Decided March 27, 1917.

#### Assumption of Risk by Passenger

A passenger is under no obligation to obey instructions of the railroad or its agents where obedience will subject passengers to great and obvious danger, and a passenger who obeys with knowledge of danger assumes the risk of injury. A passenger was seated in a safe place in a coach when a member of the train crew called out to the passengers to go into the car ahead. He picked up his traveling bag and some bundles, and went upon the platform. The train was then going so fast that, as he testified, he was afraid the car would jump the track or break its coupling. He was thrown from the platform as the train was rounding a curve. In an action for his injuries the New Jersey Supreme Court held he had assumed the risk of an obvious danger, and the railroad was not liable.—*McGrath v. D. L. & W. (N. J.)*, 100 Atl., 753.

#### "Intrastate Commerce"—Transportation of Circuses

The Arizona Supreme Court holds that, in a proceeding before the Arizona Corporation Commission to compel a railroad to transport the Campbell's United Shows from Tucson to Phoenix, the movement between these points was intrastate, subject to the jurisdiction of the commission, although the shows were engaged in a journey beginning in Texas and ending in California, the movement of the circus being a mere incident to the object of its existence.—*Cunningham, J.*, dissented, on the ground that, as it is the commencement and ending of the continuous journey in contemplation which fixes the character of interstate commerce upon the thing moved, the movement was interstate, and therefore the commission's order fixing a freight rate was void and incapable of placing a duty of transportation on the railroad company.—*Southern Pacific v. State (Ariz.)*, 165 Pac 303. Decided May 19, 1917.

#### Crossing Accident—Contributory Negligence

In an action for death of a motorcycle rider by being run over by a fast passenger train at a crossing, it appeared that the deceased approached the crossing without looking for trains, though an approaching train could have been seen had he looked. The Louisiana Supreme Court holds that the deceased's negligence continued to the moment of the accident so as to be a contemporaneous contributing cause, and the railroad was therefore not liable for the negligence of the engineer in failing to make an emergency stop upon seeing the deceased's danger. A man in full possession of his faculties, who goes upon a railroad track, must be held to know that he is upon such track, and that a train may be coming at any time, and must be held to the necessity of using his senses for his safety, and cannot absolve himself of negligence because of absent-mindedness.—*Barnett v. Louisiana Western (La.)*, 75 So., 649. Decided June 11, 1917.

## Equipment and Supplies

### LOCOMOTIVES

THE SOUTHERN PACIFIC is asking prices on 41 Santa Fe type and 10 six-wheel switching locomotives.

THE J. G. WHITE ENGINEERING COMPANY, New York, recently received a 300-hp. gasoline locomotive from the McKeen Motor Car Company, Omaha, Neb.

THE UNITED STATES GOVERNMENT has placed orders with the Baldwin Locomotive Works for 764 locomotives in addition to the 150 that company now has on order, and the 150 which will be built by the American Locomotive Company. The locomotives are for service with the forces in France, and will be given preference over all other work. The new order is as follows:

380	80 ton	Standard gage	Consolidation
195	.....	60 c m gage*	2-6-2
126	50 hp.	60 c m gage	Gasoline
63	30 hp.	60 c m gage	Gasoline

\* 60 c m equals 1 ft. 11 1/2 in.

The previous order for 300 locomotives, as was reported in the *Railway Age Gazette* of July 20, includes 150 80-ton standard gage Consolidation locomotives ordered from the Baldwin Locomotive Works, and 150 from the American Locomotive Company. The Baldwin Locomotive Works completed the first locomotive on its order last Saturday, and is building the remainder at the rate of four a day.

### FREIGHT CARS

THE MARK MANUFACTURING COMPANY, Chicago, has ordered 18 70-ton capacity steel gondola cars of special construction from the American Car & Foundry Company.

THE ILLINOIS CENTRAL recently received from the McKeen Motor Car Company, Omaha, Neb., a 50-hp. distillate weed burner.

THE UNITED STATES GOVERNMENT has distributed orders among a number of car building companies for 6,000 30-ton standard gage and 2,997 narrow gage freight cars for service with the American forces in France. The standard gage cars will have two trucks, and are distributed as follows:

1200	Low side gondola.....	Pressed Steel Car
1000	Box .....	} Am. Car & Fdy.
300	Tank .....	
900	High side gondola.....	} Standard Steel Car
800	Box .....	
600	Flat .....	} Haskell & Barker
300	Refrigerator .....	
900	Box .....	Pullman

The narrow gage cars are of 600 mm. gage, the order being distributed as follows:

500	Flat .....	} Pressed Steel Car
100	Trucks .....	
166	Tank .....	} Am. Car & Fdy.
700	Low side gondola.....	
400	Low side gondola.....	Ralston Steel Car
400	Low side gondola.....	Magor Car
666	Box .....	Standard Steel Car
165	Gondola .....	Standard Steel Car

### IRON AND STEEL

THE UNITED STATES GOVERNMENT has issued an inquiry for 20,000 tons of 25-lb. rail for use in France.

THE MISSOURI PACIFIC has ordered 180 tons of steel from the American Bridge Company for a riveted truss span at Sweet Springs, Mo.

### MISCELLANEOUS

THE PITTSBURGH & LAKE ERIE has awarded a contract to the Roberts & Schaefer Company, Chicago, for a complete tandem four-pit cinder handling plant for installation at Haselton, Ohio.



## Supply Trade News

P. M. Kling, consulting engineer of the Laconia Car Company, Leconia, N. H., has resigned. Mr. Kling retires, after having spent 34 years in the car industry.

The Hazard Manufacturing Company, Wilkesbarre, Pa., announces the appointment of George B. North as general sales manager, with headquarters at New York.

A. T. Stewart, general freight agent of the Missouri Pacific at Kansas City, Mo., has resigned, effective August 15, to become general traffic manager of the Sinclair Refining Company and the Sinclair-Gulf Corporation, with headquarters at Chicago.

McCord & Co. have purchased three and one-half acres of land at West Pullman, Ill., from the Illinois Central. This property has been occupied by the purchasers for the last two years under a lease from the Illinois Central, with the option of purchase. A part of the property is improved with a plant which has been used as a steel foundry for the manufacture of journal boxes.

James K. Howard has been appointed assistant to the president of the A. G. A. Railway Light & Signal Company, Elizabeth, N. J., with headquarters at Elizabeth. Mr. Howard was born on August 8, 1871, at Zanesville, Ohio. He entered railway service on the New Haven & Derby as a rodman, leaving that road in 1890 to enter Rutgers College. He left this institution in 1893 to enter the employ of the Peoria & Pekin Union, serving successively as assistant engineer and engineer until 1899. In July, 1900, he went with the Wabash as division engineer, holding this position until July, 1905, when he entered the service of the Chicago, Peoria & St. Louis as engineer of maintenance of way. After serving in this capacity until January, 1907, he left the C. P. & St. L. to become engineer in charge of railway surveys in eastern Ohio and western Pennsylvania. In July, 1910, he was appointed engineer of maintenance of way on the Ann Arbor, leaving in January, 1913, to become assistant chief engineer for the Lorain, Ashland & Southern. In October, 1916, he was appointed northwestern representative of the A. G. A. Railway Light & Signal Company, with headquarters at Chicago, which position he held until his recent appointment as assistant to the president.

### Unfilled Steel Orders Decrease

United States Steel Corporation reports that unfilled orders on hand July 31 amounted to 10,844,164 tons, a decrease of 539,123 tons, as compared with 11,383,287 tons on hand June 30.

Unfilled tonnage on May 31 amounted to 11,886,591 tons; on April 30, 12,183,083 tons; on March 31, 11,711,644 tons, and on July 31, 1916, 9,593,592 tons.

### TRADE PUBLICATIONS

**LATHES.**—An attractive eight-page booklet recently issued by the Gisholt Machine Company, Madison, Wis., gives a number of illustrations of Gisholt lathes and time studies of work of various kinds of work turned out on them. The booklet contains a striking cover bearing the inscription: "Old Glory and the Allies," and showing the flags of all the nations now waging war on Germany.

**PNEUMATIC PAINTING EQUIPMENT.**—The Spray Engineering Company, 93 Federal street, Boston, Mass., has recently issued a folder describing its equipment for applying all kinds of liquid coatings with the Spraco paint gun. Particular attention is called to an extension pole attachment made up of a jointed fiber rod, which is used for covering surfaces beyond the reach of the operator, thus eliminating the necessity for staging or ladders.

**ELECTRIC HOISTS.**—The Lidgerwood Manufacturing Company, 96 Liberty street, New York, has recently issued bulletin No. 20, on Lidgerwood electric hoists. The bulletin contains 31 pages, each of which is devoted to a separate type of hoist, which is illustrated with a photograph. The special work for

which the hoist is designed is then described, as are the special features of the hoist. Finally a table of sizes is given containing all the necessary detailed information.

**TIN PLATE.**—The American Steel Export Company has recently published a 16-page illustrated booklet thoroughly describing in a concise way the practice of American makers of tin plate. The chief object of the booklet is the elimination of the confusion existing in the export trade because of the difference in the methods employed in the various countries where this commodity is manufactured. It deals first with a brief history, then the process of manufacturing. Numerous pages are devoted to the proper placing of orders, the exact method of figuring prices, and the usual method of packing for export.

**EDISON STORAGE BATTERIES FOR USE IN STORAGE BATTERY LOCOMOTIVES** is the title of bulletin 608 of the Edison Storage Battery Company, Orange, N. J. This bulletin, which is just off the press, describes the use of Edison storage battery locomotives in coal mining, metal mining and in general industrial service. The bulletin is full of photographs of locomotives in actual service, and there are two pages which contain complete general data and trade dimensions of Edison Type A storage batteries for storage battery locomotives. The last page describes the Edison electric safety mine lamp, which is more fully described in bulletin No. 300.

**HOISTING MACHINERY FOR INDUSTRIAL TRUCKS** is the title of a 115-page bulletin, No. 2,000, recently issued by the Shepherd Electric Crane & Hoist Company, Montour Falls, N. Y. The bulletin is loose-leaf and pocket size and contains complete and detailed specifications for the various types of hoists manufactured by the company. The class or frame size, capacity in pounds, hoisting speed feet per minute, number and size of hoisting rope, maximum lift in feet, catalogue number, shipping weight of each type of hoist are given in tabulated form, while on the opposite page the same type of hoist is shown in a line drawing where the clearance dimensions are given.

**STORAGE BATTERIES FOR INDUSTRIAL TRUCKS.**—The Edison Storage Battery Company, Orange, N. J., in bulletin No. 600, deals with Edison storage batteries for industrial transportation. The bulletin, which contains 32 pages, fully covers the use of electric tractors and trucks for use around factories, shops, freight houses, docks, terminal stations, etc. A special feature of the bulletin is the large number of photographs which illustrate the great variety of transportation work which electric trucks and tractors can do. The last few pages in the bulletin contain a general description of the Edison storage battery, how it is made and what it is made of, its operation, maintenance, etc. The last page is devoted to a table giving general data and troy dimensions of Edison storage batteries for industrial trucks, practice storage batteries, locomotives, etc.

**COAL REQUIREMENTS OF INDIAN RAILWAYS.**—It is estimated that the railways of India will require about 8,000,000 tons of coal during 1918, which represents about 20,000 tons of coal per day.

**SPAIN MOBILIZES RAILROAD MEN.**—Press despatches state that the Spanish government has decided to mobilize all railroad employees. They will remain at work, but will wear army uniforms. The Northern of Spain has issued a statement declaring there will be no strike as long as the government guarantees freedom to work. Although the Catalan railwaymen have handed the government a declaration of a general strike, conditions are still normal.

**EUROPEAN RAILWAYS AND THE COAL FAMINE.**—The shortage of fuel and its excessive cost are making themselves more and more felt in almost every country. The revenue is suffering greatly, and the service generally is much impeded. Both in Sweden and Denmark a number of trains, more especially fast trains, have been discontinued; in the latter country, for instance, the number of daily passenger trains has been reduced to less than half the normal, and fast or through trains are almost a thing of the past. As a result the trains are often overcrowded and unable to keep time. In Sweden the Board of the State Railways has just decided to propose a rise of at least 40 per cent in the present freight tariff, and a rise of 20 per cent to 25 per cent in the passenger tariff, to offset the great increase in operating expenses.—*Engineering, London.*

## Railway Construction

**GALESBURG, ROCKFORD & NORTHERN.**—The Illinois Public Utilities Commission has granted a certificate of convenience and necessity to this company for the purchase of the Hoopole, Yorktown and Tampico, and the extension of this line from Hoopole to a point on the Chicago, Rock Island & Pacific at Geneseo, a distance of approximately 12 miles.

**NEW YORK, NEW HAVEN & HARTFORD.**—This company is building with company forces a new yard between New Haven, Conn., and North Haven. In addition to the track work five steel bridges varying in length from 25 ft. to 200 ft. will be built, also general yard buildings. The grading work will be heavy.

**PENNSYLVANIA RAILROAD.**—This company has given a contract to Arthur McMullen, New York, for building the entire bridge line from Camden, N. J., to Petty's Island. (April 6, p. 765.)

**ST. LOUIS-SAN FRANCISCO.**—This company has completed plans for a railroad station at Oklahoma City, Okla. The building will be two stories high, 139 ft. wide and 146 ft. long, and will cost approximately \$300,000. It will be of reinforced concrete construction with cut stone and brick exterior. Bids for the work will be opened on September 15. Inquiries should be addressed to Lebenbaum, Marx & Vigeant, architects, Chicago.

**TEXAS ROADS (ELECTRIC).**—H. M. Gray, Las Cruces, N. Mex., and associates are promoting the construction of an electric line between Las Cruces and El Paso, Tex., about 44 miles.

**TOLEDO, ST. LOUIS & WESTERN.**—This road has completed plans for the construction of a freight house at Frankfort, Ind., and also for an extension to its office building at the same point. The specifications for the freight house call for a frame building 26 by 140 ft., the east 40 ft. of which will be two stories high and the balance one story high. The work includes the construction of an island platform 8 ft. by 150 ft., a house platform, and an incline for automobiles. The extension to the office building will be of brick construction two stories high, 20 ft. wide and 32 ft. long. In addition the company is planning improvements at Charleston, Ill., including an engine house and machine shop, a freight house and a reservoir. The engine and machine shop will be of timber and brick construction. The engine house will contain six stalls 96 ft. long. The machine shop will be 40 by 75 ft. The freight house plans provide for a one-story brick building 25 by 100 ft., with platforms, inclines, etc. The reservoir will have a capacity of 500,000 gal., and will be lined with concrete.

**A VULNERABLE RAILWAY CENTER IN GERMANY.**—Cologne has lately come in for considerable mention among advocates of air reprisals. This city is of such enormous importance as a railway center that it may without exaggeration be described as the key to the Western front. In fact it is unlikely that any other railway center has been such an important factor in the German plans of campaign ever since the beginning of the war. Study of a good railway map will show that Cologne focusses the whole railway network of Germany, forming, as it does, a junction for all the principal main lines from north and south and east. In fact, it is in some respects an even more important junction than Berlin, with which it is linked up with numerous main lines, and it is in addition the chief point in the system which runs along both banks of the Rhine, all the way from Frankfort-on-Main. In normal times, Cologne is the gateway to France and Belgium, and since August, 1914, this aspect of its importance has been enormously enhanced. Indeed, it is not too much to say that but for the network lines radiating from the Cathedral city, the whirlwind invasion of Belgium and northern France—the principal feature of the whole German plan of campaign—would have been impossible. When it is borne in mind that the only outlet to the West of all the railways entering Cologne is over a single bridge across the Rhine, which is very wide in this neighborhood, it will be realized how vulnerable is this railway center to attack from the air.—*Railway Gazette, London.*

## Railway Financial News

**BALTIMORE & OHIO.**—See comments on the annual report for the calendar year 1916 elsewhere in this issue.

**CHICAGO & WESTERN INDIANA.**—The \$1,000,000 issue of 5 per cent notes due September 1, 1917, has been extended to September 1, 1918, at 5 per cent per annum.

**CHICAGO, BURLINGTON & QUINCY.**—This company has declared an extra dividend of 10 per cent, and the regular quarterly dividend of 2 per cent, both payable on stock of record date September 25. Books close September 19 and reopen September 25. The Chicago, Burlington & Quincy is controlled by the Great Northern and Northern Pacific Railroads, through joint ownership of practically all the \$110,839,100 stock outstanding, which is deposited behind the collateral 4's of the two controlling roads. The regular dividend rate of the Chicago, Burlington & Quincy is 8 per cent. The 10 per cent distribution by the Burlington amounts to \$11,083,910, of which about half, or \$5,500,000, will accrue to the Northern Pacific, and the same amount to the Great Northern. The Northern Pacific has outstanding \$248,000,000 capital stock, and the Great Northern \$249,476,850 preferred stock (there is no common stock), so that the Burlington distribution is equivalent to 2.2 per cent on both Northern Pacific and Great Northern preferred.

See also editorial comments elsewhere in this issue.

**CINCINNATI, HAMILTON & DAYTON.**—After protracted negotiation a settlement has been reached between the Baltimore & Ohio and the minority owners of Cincinnati, Hamilton & Dayton general mortgage bonds of 1939, which will complete the reorganization begun when the Baltimore & Ohio took over the operation and control of the Cincinnati, Hamilton & Dayton in 1909. Negotiations were principally carried on through Iselin & Co., and it is reported the minority bondholders will be allowed either \$1,000 in B. & O. Toledo Division 4 per cent bonds, plus \$140 in cash, for each \$1,000 C. H. & D. bond, or \$800 in Toledo Division bonds, plus \$280 in cash, the Baltimore & Ohio reserving an option to purchase the bonds for \$840 apiece in cash. The minority interest involved represents somewhat less than \$2,000,000 in face value of the bonds, out of \$17,529,000 issued, the bulk having been purchased by the Baltimore & Ohio at 70 and interest. The minority owners held out for the original offer of 85 with interest, or an exchange bond guaranteed by the Baltimore & Ohio.

**GREAT NORTHERN.**—This company has sold \$20,000,000 three-year 5 per cent notes to the First National Bank of New York. The notes were offered at 98 and interest, to yield 5¾ per cent. They are dated September 1, 1917, and are secured by \$25,000,000 of the company's first and refunding mortgage 4¼ per cent bonds which are due in 1961. The notes are redeemable at any time before September 1, 1918, at 101 and interest, and at any time thereafter before maturity at 100½ and interest. The purpose of the issue is to provide the Great Northern with funds to pay for improvements and equipment already purchased. The last previous important financing by the Great Northern was in 1911, when \$20,000,000 first and refunding 4¼ per cent bonds due 1961 were sold to J. P. Morgan & Co., the First National Bank and the National City Bank, who offered them at 102.

See also Chicago, Burlington & Quincy.

**MISSOURI PACIFIC.**—The syndicate which underwrote the \$46,000,000 cash requirements of the reorganization plan has been closed with the mailing of checks to syndicate members by Kuhn, Loeb & Co. The profit was 3 per cent, representing a distribution of \$1,380,000 to the subscribers who have been for more than a year liable for the cash requirements of the plan. This finally cleans up practically all matters pertaining to the Missouri Pacific reorganization, except that further opportunity will be given to a few stockholders, mostly residing abroad, to come in under the terms of the plan when the war situation permits them to deposit their securities.

**NORTHERN PACIFIC.**—See Chicago, Burlington & Quincy.



# ANNUAL REPORTS

## ST. LOUIS SOUTHWESTERN RAILWAY CO.—TWENTY-SIXTH ANNUAL REPORT "COTTON BELT ROUTE."

CHAIRMAN OF THE BOARD AND PRESIDENT.

NEW YORK, April 16, 1917.

To the Stockholders of the  
St. Louis Southwestern Railway Company:

The Twenty-sixth annual report of your company, for the calendar year ended December 31, 1916, is herewith presented.

The report of Mr. J. M. Herbert, First Vice-President in Charge, which follows, exhibits full and complete details of operating revenues, expenses and other operating results, as well as the financial and physical condition of the property.

The amount of expenditures made on account of, and charged to, "Road and Equipment—Road" during the six months ended December 31, 1916, was \$142,005.64, of which there was appropriated from Income, \$132,579.61, representing expenditures made by the Company, and from Surplus, \$9,426.03, on account of "Donations" made by Individuals and Companies—like amounts being credited to "Corporate Surplus—Additions to Property through Income and Surplus."

It will be observed that the better earnings of the last fiscal year, while not in the judgment of the directors justifying any distribution to stockholders, have enabled the Company to improve its financial position and to liquidate floating liabilities of \$785,000 accumulated as a result of former operations.

Special attention is invited to Exhibit "R" containing a summary of Property Investments and Advances Unfunded, Cash Loans to Controlled and Affiliated Lines, and Unpledged Securities (not necessary for control) held in the Treasury as of December 31, 1916.

### CAPITAL STOCK.

No change has been made in the Capital Stock during the period covered by this report. Exhibit "M" on page 39 shows the par value authorized and the par value outstanding as of December 31, 1916.

### FUNDED DEBT.

The amount of Funded Debt, outstanding in hands of the public, was increased during the period under review in the sum of \$285,000, explained as follows:

Equipment Trust Obligations Issued:

Series "F"—Guaranty Trust Co. of New York, Trustee:

For Equipment:

12 Consolidation Freight Locomotives } \$420,000.00  
8 Ten-wheel Passenger Locomotives }

Deduct:

Equipment Trust Obligations Matured and Paid:

Special Equipment Trust—The Philadelphia

Trust Safe Deposit and Insurance Co.—

Trustee ..... \$33,000.00

Series "D"—U. S. Trust Co. of New York—

Trustee ..... 17,000.00

Series "E"—Guaranty Trust Co. of New

York—Trustee ..... 85,000.00

135,000.00

Net Increase ..... \$285,000.00

The Public Service Commission of the State of Missouri, after a full hearing, duly approved the issuance of the Equipment Trust Obligations as shown in the foregoing statement.

Detailed exhibits of Funded Debt as of December 31, 1916, will be found on pages 40 and 41.

The faithful and efficient services of the officers and employees of the Company are acknowledged, with pleasure.

For the Directors,

EDWIN GOULD,

Chairman of the Board  
and President.

St. Louis, Mo., April 2, 1917.

MR. EDWIN GOULD,

Chairman of the Board and President,

New York City, N. Y.

DEAR SIR:—

Pursuant to the order of the Interstate Commerce Commission, dated November 24, 1916, establishing the calendar year as the fiscal year for common carriers by rail, and the subsequent action of the Board of Directors, changing the fiscal year of this company accordingly, I present herewith a report upon the business and operations of the Company for the calendar year ended December 31, 1916, and its financial and physical condition as of that date.

The last report to the Stockholders was for the fiscal year ended June 30, 1916, and the report now submitted continues the operations and financial transactions for the period, July 1 to December 31, 1916 (thus preserving the continuity of records and statistics without duplication), and also contains Income and Profit and Loss statements for the full calendar years 1916 and 1915, for comparative purposes.

The financial results from operation for the calendar years 1916 and 1915, and for the six months periods, July 1 to December 31, 1916, and 1915, will be found in the condensed statements immediately following:

### FINANCIAL RESULTS FROM OPERATION—SYSTEM.

#### INCOME STATEMENT FOR CALENDAR YEAR.

ITEM.	YEAR ENDED. Dec. 31, 1916.	Dec. 31, 1915.	+Increase. —Decrease.
AVERAGE MILES OPERATED.....	1,753.8	1,753.8	—
OPERATING INCOME:			
Railway Operating Revenues.....	\$13,850,130.43	\$11,275,023.98	+\$2,575,106.45
Railway Operating Expenses.....	9,318,305.55	7,848,790.52	+ 1,469,515.03
Net Revenue from Ry. Operations	\$4,531,824.88	\$3,426,233.46	+\$1,105,591.42
Railway Tax Accruals .....	\$615,813.76	\$598,792.84	+ \$17,020.92
Uncollectible Railway Revenues...	2,377.36	3,458.52	— 1,081.16
Total .....	\$618,191.12	\$602,251.36	+ \$15,939.76
Railway Operating Income.....	\$3,913,633.76	\$2,823,982.10	+\$1,089,651.66
NONOPERATING INCOME .....	1,528,996.77	1,127,794.04	+ 401,202.73
GROSS INCOME .....	\$5,442,630.53	\$3,951,776.14	+\$1,490,854.39
DEDUCTIONS FROM GROSS INC..	3,220,465.56	3,215,763.88	+ 4,701.68
NET INCOME .....	\$2,222,164.97	\$736,012.26	+\$1,486,152.71

### DISPOSITION OF NET INCOME:

Income Appropriated for Invest. in Phys. Property .....	132,579.61	—	+ 132,579.61
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INCOME BALANCE TRANSFERRED TO PROFIT AND LOSS.....	\$2,089,585.36	\$736,012.26	+\$1,353,573.10
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### PROFIT AND LOSS STATEMENT.

ITEM.	YEAR ENDED. Dec. 31, 1916.	Dec. 31, 1915.	+Increase. —Decrease.
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#### CREDITS:

Credit Balance (at beginning of fiscal period) .....	\$4,212,863.27	\$3,669,330.13	+ \$543,533.14
Credit Balance Trans. from Income.	2,089,585.36	736,012.26	+ 1,353,573.10
Unrefunded Overcharges .....	1,083.74	779.94	+ 303.80
Donations .....	11,701.74	10,759.10	+ 942.64
Miscellaneous Credits .....	60,482.08	21,426.94	+ 39,055.14
Total .....	\$6,375,716.19	\$4,438,308.37	+\$1,937,407.82

#### DEBITS:

Surplus Appropriated for Investment in Physical Property.....	\$11,701.74	\$10,759.10	+ \$942.64
Funded Debt Discount Extinguished through Surplus .....	16,178.62	795.20	+ 15,383.42
Loss on Retired Road and Equip- ment—Road .....	28,656.12	18,203.12	+ 10,453.00
Loss on Retired Road and Equip- ment—Equipment .....	195,528.17	44,646.18	+ 150,881.99
Delayed Income Debits:			
Reparation Claims and Expenses			
Ark. Rate Case .....	6,260.41	115,370.95	— 109,110.54
Tap Line Reparation Claims.....	3,752.44	23,435.85	— 19,683.41
Miscellaneous .....	16,677.76	—	+ 16,677.76
Miscellaneous Debits .....	22,405.35	12,234.70	+ 10,170.65
Balance, Credit, Carried to General Balance Sheet .....	6,074,555.58	4,212,883.27	+ 1,861,692.31
Total .....	\$6,375,716.19	\$4,438,308.37	+\$1,937,407.82

### FINANCIAL RESULTS FROM OPERATION—SYSTEM.

#### INCOME STATEMENT FOR SIX MONTHS.

ITEM.	SIX MONTHS ENDED. Dec. 31, 1916.	Dec. 31, 1915.	+Increase. —Decrease.
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AVERAGE MILES OPERATED.....	1,753.8	1,753.8	—
OPERATING INCOME:			
Railway Operating Revenues.....	\$7,906,459.74	\$6,280,778.60	+\$1,625,681.14
Railway Operating Expenses.....	4,884,093.94	3,972,574.06	+ 911,519.88
Net Rev. from Ry. Operations...	\$3,022,365.80	\$2,308,204.54	+ 714,161.26
Railway Tax Accruals.....	\$306,615.10	\$289,876.86	+ \$16,738.24
Uncollectible Railway Revenues...	1,323.08	2,280.05	— 956.98
Total .....	\$307,938.18	\$292,156.92	+ \$15,781.26

Railway Operating Income.....	\$2,714,427.62	\$2,016,047.62	+\$698,380.00
NONOPERATING INCOME .....	747,591.00	498,227.42	+ 249,363.58

GROSS INCOME .....	\$3,462,018.62	\$2,514,275.04	+\$947,743.58
DEDUCTIONS FROM GROSS INC..	1,616,758.86	1,623,725.08	— 6,966.22

NET INCOME .....	\$1,845,259.76	\$890,549.96	+\$954,709.80
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### DISPOSITION OF NET INCOME:

Income Appropriated for Invest. in Phys. Property .....	132,579.61	—	+ 132,579.61
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INCOME BALANCE TRANSFERRED TO PROFIT AND LOSS.....	\$1,712,680.15	\$890,549.96	+ 822,130.19
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### PROFIT AND LOSS STATEMENT.

ITEM.	SIX MONTHS ENDED. Dec. 31, 1916.	Dec. 31, 1915.	+Increase. —Decrease.
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#### CREDITS:

Credit Balance (at beginning of fiscal period) .....	\$4,504,629.45	\$3,409,524.08	+\$1,095,105.37
Credit Balance Trans. from Income	1,712,680.15	890,549.96	+ 822,130.19
Unrefundable Overcharges .....	448.44	—	+ 448.44
Donations .....	9,426.03	4,841.25	+ 4,584.78
Miscellaneous Credits .....	1,714.37	2,565.37	— 851.00
Total .....	\$6,228,898.44	\$4,307,480.66	+\$1,921,417.78

#### DEBITS:

Surplus Appropriated for Investment in Physical Property.....	\$9,426.03	\$10,759.10	— \$1,333.07
Funded Debt Discount Extinguished through Surplus .....	15,078.07	—	+ 15,078.07
Loss on Retired Road and Equip- ment—Road .....	3,286.98	10,255.48	— 6,968.50
Loss on Retired Road and Equip- ment—Equipment .....	108,985.58	35,022.23	+ 73,963.35
Delayed Income Debits:			
Reparation Claims and Expenses—			
Ark. Rate Case .....	27.95	6,152.01	— 6,124.06
Tap Line Reparation Claims.....	—	23,435.85	— 23,435.85
Miscellaneous .....	16,677.76	—	+ 16,677.76
Miscellaneous Debits .....	860.49	8,992.72	— 8,132.23
Balance, Credit, Carried to General Balance Sheet .....	6,074,555.58	4,212,883.27	+ 1,861,692.31
Total .....	\$6,228,898.44	\$4,307,480.66	+\$1,921,417.78

Inasmuch as the business for the fiscal year ended June 30, 1916, has been fully presented in the preceding annual report, the following com-

ments and statements (excepting statements of Income and Profit and Loss for the calendar years 1916 and 1915) are confined to the operations for the six months period, July 1 to December 31, 1916, compared with the same period of 1915, and to the changes in the assets and liabilities as reflected in the general balance sheet as of December 31, 1916, compared with that of June 30, 1916.

#### OPERATING REVENUES.

The total operating revenues for the six months period amounted to \$7,906,459.74, an increase of \$1,625,681.14, or 25.88%, compared with the same period of preceding year. In Exhibit "A" on page 28, will be found a statement showing separately the increases and decreases in each of the several classes of revenues.

Comparative exhibits containing interesting data of a statistical nature as to the freight and passenger operations, will be found on pages 46 and 47.

#### OPERATING EXPENSES.

During the six months period, the total operating expenses were \$4,884,093.94, an increase of \$911,519.88, or 22.95%, compared with the same period of preceding year.

Attention is called to Exhibit "A" on pages 28 and 29, in which is shown the increases and decreases in the several general operating expense accounts, and the ratios of each to total operating revenues, also to Exhibit "B" on pages 30 and 31, showing operating expenses by primary as well as by general accounts.

It will be noted that an increase of \$1,625,681.14 (or 25.88%) in operating revenues was accomplished with an increase of only \$287,409.80 (or 15.81%) in Transportation Expenses, and that of the increase in operating revenues, only 17.68% was used to take care of the increase in Transportation Expenses.

The ratio of Transportation Expenses to Total Operating Revenues for the six months period was 26.62% for the System. For the St. Louis Southwestern Railway Company, proper, it was 22.10%.

Notwithstanding increases of \$300,220.76, or 28.32%, in Maintenance of Equipment and \$227,705.49, or 36.07%, in Maintenance of Way and Structures, the relatively small increase in Transportation Expenses resulted in a reduction in the ratio of Total Operating Expenses to Total Operating Revenues from 63.25% for the period of preceding year to 61.77% for the period under review.

#### CAR AND TRAIN LOADING.

Following will be found tables showing the average load, in tons, per loaded freight car mile, and per freight train mile, for the past eight and one-half years:

Average number of tons (including company material) per loaded car mile:

Year ended	St. L. S-W. Ry. Co.	St. L. S-W. Ry. Co.	System.
June 30.	of Texas.	of Texas.	
1909	17.84	16.67	17.49
1910	18.58	16.89	18.14
1911	18.78	17.30	18.32
1912	18.02	16.44	17.54
1913	18.36	16.44	17.78
1914	18.22	16.19	17.62
1915	17.95	16.57	17.55
1916	18.18	17.40	17.95
Six Months ended			
Dec. 31, 1916.	18.72	17.23	18.30

Average number of tons (including company material) per train mile:

Year ended	St. L. S-W. Ry. Co.	St. L. S-W. Ry. Co.	System.
June 30.	of Texas.	of Texas.	
1909	394.23	190.34	301.61
1910	434.16	196.27	326.11
1911	423.70	200.04	320.16
1912	447.25	211.19	340.58
1913	461.11	214.50	349.49
1914	455.14	199.32	337.65
1915	457.53	208.21	345.21
1916	489.88	252.71	386.40
Six Months ended			
Dec. 31, 1916	497.85	251.93	394.12

The handling of freight, to and from connecting lines, during the six months period ended December 31, 1916, was seriously interfered with on account of the unprecedented congestion of freight traffic throughout the country, especially in the East, which resulted in numerous embargoes being placed from time to time by Eastern carriers. In consequence of this congestion, the shipment of much of the 1916 crop of cotton was necessarily withheld until after December 31, 1916.

#### SHORTAGE OF FREIGHT CARS.

During the latter part of July, 1916, the shortage of freight cars was quite apparent, and by September 1st had become extremely acute. The demand for cars increased from week to week, causing the greatest car shortage in the history of the Company.

On account of being an originating carrier, the greater part of this company's cars were sent beyond its rails, and in spite of repeated efforts to secure a corresponding return of equipment from connecting lines, very little was accomplished in that direction. This condition reduced the supply of cars on this company's lines to approximately fifty per cent of its ownership, which condition had a material effect on the Company's revenues.

Late in the Fall of 1916 the Interstate Commerce Commission initiated a hearing at Louisville, Kentucky, with the object of forcing cars home to owners; various orders were issued to accomplish this, but practically no benefit was derived therefrom.

#### RATE SITUATION.

The financial results from operation for the period of six months covered by this report were adversely affected, in no small degree, by increases in wages and in cost of materials and supplies.

Since the close of the period ended December 31, 1916, the constantly advancing prices of materials and supplies of all kinds, including fuel, growing out of the European conflict and various other causes, have acquired a momentum which has carried them to figures unheard of heretofore.

Added to these almost prohibitive costs, the railroads have been required to shoulder numerous additional burdens, such as: higher wages for trainmen and engineers, under provisions of the Adamson Law, effective January 1, 1917, necessary increases in the wages of other employees of all classes, higher rates of taxes and additional forms of taxation as well as other onerous increased expenses which have to be met.

These conditions, coupled with a lack of adequate facilities and available credit, have brought the railroads and the public face to face with a most critical situation. In order that the railroads may be placed in a position to efficiently handle existing traffic and be prepared to meet the

necessities of the international situation, it is absolutely essential that they be granted higher rates.

Realizing the emergency now confronting them the railroads have made application to the Interstate Commerce Commission for a general advance in interstate freight rates and to the various state rate-making bodies for similar general advances in State rates.

It is hoped that both the Federal and State rate-making bodies, recognizing the acute predicament in which the railroads now find themselves, as well as the justice of their claims, will speedily grant the necessary relief in the way of the prayed-for advances in rates.

#### AGRICULTURAL AND INDUSTRIAL.

Agriculture is one of the most important industries of the Southwest and a proper appreciation of the many opportunities for improvement in agricultural methods should result in a corresponding increase in agricultural resources. This can best be accomplished through education and demonstration of proven principles of farm management, through encouragement of the live stock industry and conservation of soil fertility. Much educational work has been conducted along these lines by the Company's Agricultural and Industrial Department.

The six months period covered by this report includes the harvest time for the 1916 crops. During this period, the territory served by this company's lines has enjoyed unusual prosperity due to good crops, high price of cotton, its by-products, and grains, and because of the fact that the farmers have practiced crop diversification and have produced the greater portion of their living on their farms. The nation-wide campaign, in which this company is taking an active interest, to grow more feed and foodstuffs will, no doubt, be productive of good results during the 1917 crop season.

The rice crop of Arkansas was the largest and best in the history of the industry and highly profitable to the growers. However, the shipment of a large part of this crop was delayed beyond the period of this report, on account of the car shortage and other conditions.

The demand for lumber and other forest products has been good, and the movement during the six months period under review has been as heavy as the car supply would permit. The extreme car shortage which prevailed during all of the latter part of 1916, made it impossible to supply all of the cars required for the lumber industry, and while the tonnage was greater than during the corresponding period of the previous year, this increase was largely due to the heavier loading per car. The present demand for lumber is unprecedented and with a better car supply should show a greater tonnage for 1917.

Throughout the territory traversed by this company's lines, there has been a most noticeable continuation of industrial development. Cities, towns, and rural communities have undergone substantial improvements, especially as to more and improved types of schools, construction of good roads, drainage ditches, etc.

The enactment of the Federal Farm Loan Law will have a tendency to stabilize farm credits in the South and to make it possible for the farmers to borrow money from usual sources at a reasonable rate of interest and under conditions whereby they can make more permanent improvements. In order to place the advantages of the Federal Farm Loan act clearly before the farmers, the Agricultural and Industrial Department of these lines has distributed a large number of the Federal Farm Loan "primers" and have also given instructions in meetings and otherwise as to the proper methods to pursue in the formation of local Federal Farm Loan Associations. In several localities, local associations have already been formed in anticipation of the establishment of the Federal Farm Loan Banks, which will put the law into practical operation.

#### FEDERAL VALUATION.

The work of valuation of these lines, begun by the Interstate Commerce Commission late in the year of 1914, was continued during the six months under review. The field forces of the Government have completed their work on the line, and the data obtained taken to the Chicago Office of the Division of Valuation for pricing and final summary.

The preparation of Land and Equipment data, which is being compiled by the Company in response to orders of the Commission, is under way and will probably be ready for submission in the Summer of 1917. The accounting forces of the Division of Valuation who have been at work on the Company's books since February 8, 1915, are still engaged, and, it is expected, will complete their work in the Company's general offices by the middle of the Year 1917. As nearly as can be determined at this time, the commission's "Tentative Valuation" of these lines will be served in the latter part of 1917 and under the Valuation Act the Company will have thirty days within which to file its protest.

The amounts expended by these lines on account of Federal Valuation work to date are as follows:

Year ended June 30, 1915.....	\$14,812.81
Year ended June 30, 1916.....	30,639.66
Six months ended December 31, 1916.....	10,478.17
Total .....	\$55,930.64

During the latter part of 1916, the Commission served "Tentative Valuations" on four carriers, viz.: The Atlanta, Birmingham & Atlantic Railroad Company, The Texas Midland Railroad Company, New Orleans, Texas & Mexico Railroad Company and The Kansas City Southern Railway Company. Each of these carriers filed vigorous protests against the methods employed and results obtained by the Commission and several hearings have since been held in connection therewith. These hearings have been attended by representatives of the Company.

#### INVESTMENT IN ROAD AND EQUIPMENT.

In Exhibit "H" on page 35, under heading "Investment in Road and Equipment" will be found a statement of expenditures made for additions and betterments during the six months period ended December 31, 1916.

#### EQUIPMENT.

On page 61 will be found a list of equipment owned as of December 31, 1916, compared with June 30, 1916, showing changes made during the six months period.

Eight ten-wheel passenger locomotives and twelve consolidation freight locomotives, acquired under the terms of an Agreement of Conditional Sale, and referred to in the preceding annual report, have been received and placed in operation since the close of the period ended December 31, 1916.

A program is now in effect which provides for the rehabilitation of freight equipment, extending over a period of three years. This program involves the dismantling and rebuilding of 4,650 box cars at the rate of 1,550 per annum, heavy maintenance repairs to 829 freight cars of various classes, the retirement (by scrapping or sale) and "writing out" of Road and Equipment—Equipment account, of 537 light capacity (40,000 pound) freight cars of various classes, which are no longer fit for service on account of light capacity, old age and decay, and the equipping of freight-train cars owned with safety appliances, United States standard, all of which work is now being carried on at the Company's shops. At close of



the period ended December 31, 1916, 616 box cars have been dismantled and rebuilt, and heavy repairs have been made to 343 cars of various classes, and 71 of the obsolete light capacity cars, have been scrapped or sold and their original cost "written out" of the Equipment account. The program for equipping cars with safety appliances, United States standard, is well under way and it is now anticipated that all freight cars will meet the requirements of the Interstate Commerce Commission not later than March 1, 1918, the final date set by the Commission for compliance with the Safety Appliance Act.

Since the period covered by this report, contract has been let for the building of 125 steel underframe, 80,000 pound capacity, box cars to fill the vacancies caused by destruction of a similar number of 60,000 pound capacity wooden box cars, covered by Equipment Trust Agreements, and arrangements have been made to fill such vacancies in future by building the cars at Company shops.

#### VALLEY TERMINAL RAILWAY.

The Valley Terminal Railway has been organized for the purpose of constructing a complete freight terminal at Valley Junction, in St. Clair County, Illinois, adjoining East St. Louis. The capital stock of the Valley Terminal Railway is owned by this company. Property (consisting of about 126 acres of land) has been acquired, plans for the track lay-out, engine house, machine and car repair shops, and various other buildings have been made, and at the date of this report, work has been commenced, and if weather conditions permit, it is hoped the work may be completed during September or October of the present year.

This Terminal will connect with the Missouri Pacific—St. Louis Southwestern Joint Illinois main line, and The Terminal Railroad Association of St. Louis (through its subsidiary, the Illinois Transfer Railroad), at Valley Junction, Illinois, and with both the Alton & Southern and Illinois Central Railroads at the East end. At present it is the intention to lay about fourteen miles of track.

#### EXHIBIT R.

SUMMARY OF PROPERTY INVESTMENTS AND ADVANCES UNFUNDED, CASH LOANS TO CONTROLLED AND AFFILIATED LINES, AND UNPLEDGED SECURITIES (NOT NECESSARY FOR CONTROL) HELD IN COMPANY'S TREASURY, AS OF DECEMBER 31, 1916—SYSTEM.

ACCOUNTS.	DETAILED AMOUNT.	TOTAL AMOUNT.
St. L. S-W. Ry. Co. of Texas, expenditures, INVESTMENT IN ROAD AND EQUIPMENT—ROAD, UNFUNDED—		
St. L. S-W. Ry. Co., expenditures, January 1 to June 30, 1916.....	\$34,856.08	

St. L. S-W. Ry. Co. of Texas, expenditures, January 1 to June 30, 1916.....	482,643.43	\$517,499.51
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#### INVESTMENTS IN AFFILIATED COMPANIES—

##### BONDS—UNPLEDGED—

Paragould S-E Ry. Co., First and Ref. Mtg. Bonds—Par Value.....	\$511,000.00	
Southern Ill. & Mo. Bridge Co., First Mtg. Bonds—Par Value.....	600,000.00	1,111,000.00

##### ADVANCES—OPEN ACCOUNTS—

So. Ill. & Mo. Bridge Co.—Cons. Adv..	\$40,099.29	
Gray's Point Term. Ry. Co.—Cons. Adv.	25,456.88	
Paragould S-E Ry. Co.—Cons. Adv....	3,454.02	
The Pine Blf. Ark. Riv. Ry.—Cons. Adv.	30,472.83	
Memphis R. R. Term. Co.—Cons. Adv..	110,297.10	
Dal. Term. Ry. & U. D. Co.—Cons. Adv.	3,726.68	
Stephenville N. & S. Texas Ry. Co.—		
Construction Advances .....	54,521.18	268,027.98

#### LOANS—COV. BY BILLS RECEIVABLE—

Valley Terminal Railway.....	\$260,870.80	260,870.80
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#### UNADJUSTED DEBITS—

##### PROPERTY ADVANCES—IN SUSPENSE—

Illmo, Mo., Term.—Realty Adv. in Sus..	\$25,555.37	
Additional Freight Term., Ft. Worth, Tex:		
Total expenditures .....	\$734,911.16	
Deduct amount funded.....	250,000.00	484,911.16
		510,466.53

##### SECURITIES ISSUED OR ASSUMED, UNPLEDGED—

St. L. S-W. Ry. Co., Com. Stock—Par Val.	\$143,900.00	
St. L. S-W. Ry. Co., Pref. Stock—Par Val.	106,350.00	
St. L. S-W. Ry. Co., First Term. & U. Mtg. Bonds—Par Value.....	4,114,000.00	4,364,250.00
Total .....		\$7,032,114.82

### BROOKLYN RAPID TRANSIT CO.—REPORT OF THE BOARD OF DIRECTORS TO THE STOCKHOLDERS

FOR THE YEAR ENDING JUNE 30, 1917.

85 Clinton Street,  
Brooklyn, N. Y., July 23, 1917.

The operations of the system for the year ending June 30, 1917, with comparison for the preceding fiscal year, are shown generally in the following table:

#### COMPARATIVE STATEMENT OF THE RESULTS OF THE OPERATIONS OF THE BROOKLYN RAPID TRANSIT SYSTEM FOR YEARS ENDED JUNE 30, 1917 AND 1916.

	1917	1916	Increase+ Decrease—
Gross Earnings from Operation.....	\$29,504,018.96	\$27,948,771.81	+\$1,555,247.15
Operating Expenses .....	16,741,417.19	15,693,907.81	+ 1,047,509.38
Net Earnings from Operation .....	12,762,601.77	12,254,864.00	+ 507,737.77
Income from Other Sources.....	427,814.75	438,705.88	— 10,891.13
Total Income .....	13,190,416.52	12,693,569.88	+ 496,846.64
Less Taxes and Fixed Charges .....	7,995,178.23	7,081,737.70	+ 913,440.53
Net Income .....	5,195,238.29	5,611,832.18	— 416,593.89
Surplus at Beginning of Year.....	11,562,654.04	10,621,966.45	+ 940,687.59
Total .....	16,757,892.33	16,233,798.63	+ 524,093.70
Other Credits to Surplus during year .....	22,603.07	69,958.05	— 47,354.98
Total .....	16,780,495.40	16,303,756.68	+ 476,738.72
Of this amount there has been appropriated:			
Accounts written off.....	5,515.97	6,330.75	— 814.78
Adjustment of Expenses prior years* .....	1,088.36	8,621.97	— 9,710.33
Supersession and Depreciation .....	289,022.50	66,247.94	+ 222,774.56
Loss from operation of Employees' Restaurants .....	5,631.86	2,338.35	+ 3,293.51
Adjustment of Special Franchise and Real Estate Taxes .....	135.37	183,970.44	— 183,835.07
Expenses in connection with Thompson Legislative Investigation of Public Service Commission .....		4,850.00	— 4,850.00
Allowance to Employees in Military Service .....	17,345.81	1,425.19	+ 15,920.62
Christmas Gratuities to Employees .....	29,341.29		+ 29,341.29
Dividend on B. R. T. Co.'s Stock outstanding .....	4,467,318.00	4,467,318.00	
Total Appropriations .....	4,813,222.44	4,741,102.64	+ 72,119.80
Balance Sheet Surplus .....	\$11,967,272.96	\$11,562,654.04	+ \$404,618.92

\*Credit.

The year's surplus applicable for dividends was \$5,195,238.29—equivalent to 6.97 per cent on Brooklyn Rapid Transit Company's stock outstanding.

The gross revenue from operation was \$29,504,018.96, a gratifying increase of \$1,555,247.15, or 5.56 per cent.

The operating expenses were increased by the same influences which have prevailed generally throughout the country in cumulative force since

the breaking out of the European war, namely, the rising prices of labor and materials. These expenses aggregated \$16,741,417.19, an increase of \$1,047,509.38, or 6.67 per cent—most of which increase was represented by higher wages. The percentage of operating expense to transportation revenue was 56.74, as compared with 56.15 for the preceding year. The charges to maintenance of way and structure and equipment aggregated \$5,001,637.33, a slight increase over the charges for the preceding year. The amount expended, however, was less than the amount charged by \$120,376.02, which balance was carried to the credit or reserves. The large increase in the cost of power was due primarily to two factors, namely, the higher cost of coal, and the necessity for purchasing outside power because of delay on the part of the Public Service Commission in approving arrangements for the supply of power for rapid transit lines.

The burden of taxation continues to increase, the amount charged for the year being \$2,351,104.16, which is 27.94 per cent more than for the preceding year.

Deductions from operating income were swelled by the addition of \$442,863.36 to interest, on account of new rapid transit properties placed in operation. Other interest and rental deductions were somewhat less than for the preceding year, making the net deductions \$400,018.89 greater.

The remaining surplus is \$416,593.89 less than for the preceding year. In other words, out of an addition of \$1,555,247.15 in gross operating revenue, while \$507,737.77 was saved in net revenue, the additional charges for taxes and interest absorbed all of this saving and considerably more. Nevertheless the company was able to maintain its dividend rate of 6 per cent, and add a substantial amount to the system's surplus.

It is gratifying to note that the operations of the company's rapid transit lines in conjunction with those provided by the city under the provisions of the contracts of March 19, 1913, resulted for the year ending June 30, 1917, in earning not only the first preferential of \$3,500,000 (which accrues under the contracts to the operator and is applicable to interest on obligations outstanding prior to the date of the contracts, and to dividends), but within \$250,371.77 of interest at the rate of 6 per cent on the cost of new properties placed in operation since March 19, 1913. This deficit is cumulative and becomes a charge against future earnings before the city receives interest on its investment. The total deficiency from the beginning of temporary operation on August 4, 1913, to June 30, 1917, is \$1,037,276.78, all of which, notwithstanding that it is subsequently to be made good, has been absorbed as it accrued in the respective annual statements of the system. These results have been attained before the completion of the combined system and without the addition of any new lines which contribute materially to net earnings. The showing is indicative of the possibilities of the completed system and justifies the previously expressed confidence that it will only be a short time after complete operation when all of the operator's preferentials will have been earned and the city will begin to get interest on its investment. The Broadway subway, which is expected to contribute largely to this result, will be partially opened for operation during the next few months, but unfortunately the completion of the entire line with its resulting benefits will be still longer deferred.

#### SPECIAL BURDENS ON SURFACE LINES.

The street surface railroad companies of the system have applied to the Public Service Commission for a modification of its order of March 17, 1914, establishing certain rules and regulations regarding the issuance of transfers.

This order was accepted under protest and without waiving any legal rights, and upon the understanding that in case the effects should be adverse the companies would apply to the Commission for relief. The Commission's order required the establishment of over three hundred additional transfer points, and became effective June 1, 1914. Under the new regulations the passenger receipts of these companies have remained practically stationary, while during the three years preceding the order the average increase in passenger revenue had been over \$600,000 per year. The number of transfer passengers carried, however, has increased from 146,000,000 in 1913, to nearly 173,000,000 in 1917, and the average fare per passenger has consequently decreased from 3.41 cents in 1913 to 3.26

cents in 1917. The cost of operation has of course materially increased, and the actual rate of return for the year ending June 30, 1917, upon the book value of the properties used in operation had been only 5.984 per cent, without any reservation for contingencies. Clearly therefore relief is needed. To the extent that the Commission's order compels a return of less than what the courts have declared to be confiscatory of property, it is probably invalid. It is not to the interest, however, either of the company or of its patrons, that return on a public utility property should be limited to a rate which is merely within the limit of constitutionality. For sixty years the statutes of New York forbade a reduction of rates which would bring the return upon capital expended to less than 10 per cent, and when that law was repealed some years ago and power was given to the Public Service Commission to fix rates, there was no legislative intention to abolish the principle of encouraging the business of transportation, but, on the other hand, the legislature specifically restricted the Public Service Commissions in their exercise of rate-making powers by requiring that they should give due regard "to a reasonable average return upon capital actually expended and to the necessity of making reservation out of income for surplus and contingencies." To comply with this requirement a much larger return is called for than 6 per cent, anything less than which the courts have decided would be confiscatory of property. New capital cannot be obtained for the necessary improvements and enlargement of transit unless it is assured of an adequate return and is protected by fair official regulation.

Brooklyn and Queens are largely undeveloped territories. Many square miles of available land offer opportunity for housing a great population. Partially developed sections need additional improvements. Fully developed sections require relief from congestion. Municipal expansion and progress in large cities cannot exist without transportation. From the beginnings of growth in Brooklyn and Queens the measure of progress has been the growth of transportation. The expansion of facilities has inevitably been followed by increasing valuations of land, construction of new buildings, enlargement of industry and increase of population.

For twenty-two years our system has led this march of municipal progress. The rate of progress has encouraged investors in our securities. Their returns have as yet been almost negligible, but conservative financing and hope of the future have maintained confidence. In the meanwhile many hundreds of millions of dollars have been added to the two boroughs' wealth, and a million and a half of inhabitants to their population. This wonderful growth can be continued only if transportation does its share. Transportation cannot do its share without credit. Credit can only come with net income. More largely and vitally interested than any of our security holders in establishing for our properties a reasonable net income is every inhabitant of the greater city. To him the dividends on transit progress have been immediate and cumulative.

Increased expenditures are necessary for ample compensation to labor and for maintaining a proper standard of up-keep and service. All these cannot be possible without an adequate return to those who furnish the money.

The relief which the companies have asked is the right to charge a moderate sum for certain transfers. The abuse of the transfer privilege is one of the worst things which confronts our operations. Properly restricted transfers encourage traffic, as do low fares, but there is a limit beyond which such concessions cannot be safely made, and to that limit and beyond the Commission's order has forced us. We do not wish to be compelled to ask for an increase in the unit fare of five cents, as have surface companies of the State outside of New York City, but we are firmly convinced that the prodigal use of transfers, as now permitted, is an injury both to our properties and to the public, and that it should be materially restricted either by an abolition of many of the transfers or by a moderate charge therefor.

#### RAPID TRANSIT PROGRESS UNDER CITY CONTRACTS.

It has been extremely fortunate, both for the city and for the operators under the Dual System Contracts for the extension of rapid transit, that the principal contracts for construction and equipment were placed prior to the beginning of the present period of high prices. Otherwise the contracts could not have been entered into, and the extension of transportation facilities would have been indefinitely postponed.

This is illustrated forcibly in connection with the contracts let by the New York Municipal Railway Corporation which is carrying on the work for the Brooklyn Rapid Transit System. The quantity of structural steel contracted for, in discharging our obligations under the city agreements, has been approximately 120,000 tons—covering substantially all the requirements. The average price of this steel delivered was \$42.34 per ton. The cost today would be considerably more than twice as much per ton, besides the correspondingly increased cost of erection. The five hundred steel subway cars which we have contracted for, and about four hundred of which have been delivered, would have cost about 40 per cent more than the actual price. Deliveries of structural steel or other materials and of equipment would, of course, now be impossible within any reasonable period.

Contracts for substantially all our part of the construction and equipment contemplated by the joint arrangement with the city have been let—the principal exceptions being the continuation of the third-tracking of the Fulton Street Elevated from Nostrand Avenue to Brooklyn Bridge, which the Public Service Commission has refused to allow to proceed although most of the steel required therefor has been furnished; the ordering (under option) of one hundred additional steel subway cars; signal and line equipment for the 14th Street-Eastern line and for the 60th Street Tunnel to Queens; line equipment of the Culver Line; structural additions to the Coney Island Terminal, and increase in yard and shop facilities.

The requirement to supply a power generating plant for rapid transit lines has been suspended by the city and in lieu thereof arrangements have been entered into with the Interborough Rapid Transit Company and with the Transit Development Company for purchasing power in Manhattan and Brooklyn respectively. The Transit Development Company is a constituent company of the Brooklyn Rapid Transit System, and, in order to enable it to furnish power for the rapid transit and surface lines in Brooklyn and Queens, will largely increase its generating capacity.

On May 28, 1917, the elevated extension to Jamaica was placed in operation between Cypress Hills and Richmond Hill, and the remainder is expected to be ready for traffic during the latter part of this year.

The Coney Island Terminal work has been completed to a point of permitting operation of two tracks on the new structure from Sheepshead Bay to Culver Terminal, and while the other portions have been delayed on account of the non-delivery of steel, it is believed that the main portion of this terminal construction will be completed during the year 1917, and that the entire terminal will be ready for use during the summer of 1918, with the exception of the connection with the city-built Culver line, the construction of which is likely to be still further deferred for at least a year on account of the difficulty of obtaining steel.

The entire third-tracking of the Broadway Elevated was placed in operation between Marcy Avenue and Manhattan Junction on December 23, 1916.

The work of equipping the city-built subways has been undertaken, even before the work of construction was completed by the city, and has progressed satisfactorily. Considerable work has been done in providing substations and equipment thereof, and transmission lines.

The Public Service Commission, acting for the city, has completed the West End Elevated line, and operation thereon, which was begun in June, 1916, between the Fourth Avenue Subway at 38th Street and 84th Street, was extended to 25th Avenue on July 29, 1916, and to the Coney Island connection on July 21, 1917.

The completion of the other lines which are being constructed by the city for operation in connection with our system is still more or less uncertain. It is expected that the Broadway subway in Manhattan will be ready for operation between Canal Street and 14th Street in the early part of August. This will mean no relief in Manhattan, and will enable merely an extension of the Fourth Avenue Subway service via the Manhattan Bridge and Canal Street subway to Union Square. Those portions of the Broadway subway between Whitehall Street and Canal Street, and between 14th Street and 42nd Street, will, it is expected by the Public Service Commission, be ready for operation in October or November of the current year. The portion of the Broadway line north of 42nd Street and extending through Seventh Avenue, 59th and 60th Streets to the Queensborough Tunnel, will probably not be ready for traffic until late in the year 1918.

The Montague Street tunnel connecting the Broadway subway with the Fourth Avenue subway in Brooklyn will probably not be finished and ready for operation until the summer of 1918, and the connection between the Fourth Avenue subway and the Brighton Beach line should be ready about the same time.

The work of the city on the 14th Street-Eastern line is far behind, no contracts having yet been let for the elevated portion between Bushwick and East New York. No relief from the operation of this line is in sight for at least two years.

The completion of the new Queensborough Tunnel line connecting with the Broadway subway at 60th Street and with the Astoria and Corona lines in Queens is still remote. The construction contract calls for the work being finished in February, 1919.

No contract has yet been let by the Public Service Commission for the extension of the Centre Street Loop through Nassau-Broad Street, Manhattan, connecting with the Montague Street tunnel. This extension will furnish the link of a very important loop service from Brooklyn into lower Manhattan, via the Manhattan Bridge and Montague Street tunnel, and will do very much toward improving transit between Brooklyn and lower Manhattan. The Commission excuses its delay in letting a contract for this extension on the ground of present difficulties with respect to costs, uncertainty of deliveries of material and scarcity of labor.

#### RESULTS OF OPERATIONS UNDER JOINT ARRANGEMENT WITH CITY.

Under the terms of our contracts with the city what is called "temporary operation" began on August 4, 1913, when portions of the Centre Street Loop tracks were opened for traffic. As lines have since been placed in operation from time to time the results have been steadily expanding, and are indicated in the table presented below, which covers the full period of such operation and separately the operations for the year ending June 30, 1917. As compared with the preceding fiscal year the joint revenue increased \$1,467,762.24. The operating expenses increased \$743,250.42, leaving a gain in net revenue of \$724,511.82. Taxes, however, increased \$290,528.39. After deducting from the net revenue the company's preferential of \$3,500,000 (reserved to the operator under the contract with the city) the amount of net income applicable to interest on the new investment of both company and city was \$858,451.04, as compared with \$424,467.51 last year. As provided in the contract this net income is applied first to the payment of the company's interest. Down to June 30, 1917, the joint system's future earnings are indebted to the New York Consolidated Railroad Company (the operator) for \$1,037,276.78 deficiency in interest. The city's deficits are, contrary to rules of accounting applied to railroad companies, added to the cost of construction during the period of "temporary operation."

The table of operations is as follows:

		Year ending June 30, 1917	For the period August 4, 1913, to June 30, 1917
<b>REVENUE:</b>		\$11,100,527.19	\$36,827,671.58
Passenger Revenue .....			
Chartered Cars and Misc. Transp. Revenue .....	730.00		4,085.72
Advertising .....	116,952.50		328,875.77
Other Car and Station Privileges .....	77,833.61		228,890.46
Rent of Buildings and Other Property .....	23,952.07		100,375.56
Rent of Tracks and Terminals .....	28,035.95		132,135.81
Miscellaneous .....	23,251.08		44,314.77
<b>Total .....</b>	<b>\$11,371,282.40</b>		<b>\$37,666,349.67</b>
<b>DEDUCTIONS:</b>			
Rentals .....	\$67,460.00		\$306,806.66
Taxes .....	723,049.64		2,215,814.17
Operating Expenses, exclusive of Maintenance .....	4,520,113.06		14,975,199.15
Maintenance Fund .....	1,361,766.93		4,515,661.28
Depreciation Fund .....	340,441.73		1,128,915.27
Company's First Preferential .....	3,500,000.00		13,680,107.51
<b>Total .....</b>	<b>\$10,512,831.36</b>		<b>\$36,822,504.04</b>
<b>Net over First Preferential .....</b>	<b>\$858,451.04</b>		<b>\$843,845.63</b>
Company's Second Preferential as per Engineer's Determination of Cost .....	\$969,104.63		\$1,741,404.23
Reserve in respect of lines in operation—Anticipating Chief Engineer's Determination of Cost .....	139,718.18		139,718.18
<b>Total Second Preferential .....</b>	<b>\$1,108,822.81</b>		<b>\$1,881,122.41</b>
<b>DEFICIT* IN COMPANY'S PREFERENTIALS .....</b>	<b>\$250,371.77</b>		<b>\$1,037,276.78</b>
<b>INTEREST PAID BY CITY ON ITS COST OF CONSTRUCTION OF PROPERTY PLACED IN OPERATION PLUS SINKING FUND AT RATE OF 1 PER CENT PER ANNUM .....</b>		<b>\$2,238,516.28</b>	<b>\$3,557,244.39</b>
<b>TOTAL DEFICIT .....</b>	<b>\$2,488,888.05</b>		<b>\$4,594,521.17</b>

\* To be made good from future net income before payment of City's interest and Sinking Fund charges.

† Deficits in City's charges during temporary operation to be added to the Cost of Construction of City Owned Lines.



## EMPLOYEES' SUBSCRIPTIONS TO LIBERTY BONDS.

The participation of employees of the system in the Government Liberty Loan was particularly gratifying. The number of employees making subscriptions was 7,744, and the total number of bonds subscribed for was \$578,850. Of these bonds 10,775 were in \$50 denomination. Subscriptions came from every department, and were encouraged by the partial payment plan offered by the company, whereby to those who chose to avail themselves of this plan installments on account of subscriptions are deducted weekly or monthly from the pay rolls—the period of payment extending over one year in the case of certain employees, and over two years in the case of other employees. By this method not only was the volume of subscriptions made large, but employees were encouraged to set aside a portion of their earnings in a thrift fund. In order to finance the transaction the company borrowed the amount necessary to pay for the bonds originally, with the privilege of reducing its loan from week to week as installments on the purchase price are received from subscribers.

## EMPLOYEES' WELFARE WORK.

For various activities in the interest of the health, social entertainments, life insurance and welfare of its employees, the companies of the system expended during the year \$132,803.78, including the application to these items of \$13,487.36 received from the collection of fidelity bond premiums. Of this amount \$32,653.68 was for pensions, and \$35,559.50 was for life insurance.

On June 30, 1917, 6,245 employees were members of the Group Insurance Plan—a net increase of 497. During the fiscal year the beneficiaries of deceased employees were paid the sum of \$61,000 under the terms of the policies.

## RELATIONS BETWEEN COMPANY AND EMPLOYEES.

Throughout the labor disturbances in the summer and autumn of 1916, which temporarily interfered with the operations of most of the transportation lines of the city, our employees gave renewed evidence of their loyalty and co-operation. They repelled the efforts of outside agitators to stir up discord and to paralyze service. The sympathetic relations which had prevailed for years between men and management remained unbroken. In order that these ties might be strengthened and a fuller opportunity given for mutual consultation, the functions of the Employees' Benefit Association (comprising practically all employees) were enlarged by provision for the election by secret ballot of trustees representing the various departments of the system, who will be the spokesmen of their fellow employees, respectively, in working out in conjunction with heads of departments the improvement of working conditions. These departmental trustees meet periodically and have already accomplished much towards the purposes for which they were elected.

## FIRE INSURANCE.

The Insurance Reserve Fund was increased during the year by \$59,836.84, and amounted on June 30th last to \$898,934.92. The average amount of reinsurance in effect during the year was \$25,046,494.38, upon which the premiums made an average rate of 23.8. On account of certain adjustments this rate was somewhat sub-normal.

The fire losses during the year aggregated \$1,959.47, of which \$399.73 was paid out of the reserve fund, and the remainder through reinsurance.

Inspection for prevention of fire has been rigid and systematic, and this accounts for the very small percentage of loss.

## FREIGHT OPERATION.

The South Brooklyn Railway Company has continued to conduct the freight operations of the system. These have been interfered with considerably during the past year by reconstruction work on lines and terminals, and by the competition of automobile trucks in the carriage of beer, ice and asphalt. The freight revenues were \$505,556.09, an increase of \$12,386.04, and the operating expense was \$304,666.22.

Several new sidings at manufacturing plants have been installed, and there seems to be a tendency on the part of Brooklyn manufacturers to take further advantage of the facilities which are offered. This is particularly true in outlying territories where freight operation can be conducted without interference with the regular passenger business of the system.

## MISCELLANEOUS IMPROVEMENTS, RENEWALS AND REPAIRS.

Additions, renewals and even ordinary maintenance work have been restricted and hampered by the prevailing conditions affecting the supply of labor and materials. Not only is the work done more expensively, but on account of the impossibility or delay of getting material, much desirable work has had to be postponed. This is particularly true in renewals of track, where only a part of the reconstruction program has been carried out because of the failure to get rail. This condition seems likely to continue for at least another year.

Among the various expenditures for maintenance and construction during the fiscal year (other than construction and equipment expenditures on rapid transit lines referred to in a preceding part of this report) are the following:

The 30,000 K.W. Turbo Unit and Condenser Outfit, contracted for in January 1916, for the Williamsburg Power Station, which was to have been received in August, 1916, was not delivered until recently. The condenser has been installed and the turbo unit is being erected and is expected to be ready for service about the first of October.

Plans have been made for a further increase in power facilities by a reconstruction of the so-called Eastern Power Station, and two 35,000 K.W. Turbo Units for this station have been contracted for, to be delivered during May and November of 1919.

During the year 18 Taylor stokers were installed in the Williamsburg Power Station, making 24 in operation; 8 blower equipments have been installed, 4 of which are now in service. Orders have been placed for 36 additional stokers and 4 blower equipments, making a total of 72 stokers for the station. In the same station the rebuilding of coal downtakes for 18 boilers, and the rebuilding of ash downtakes for 11 boilers have been completed; the main steam header was rebuilt; the work of rebuilding the auxiliary steam piping in the boiler room on account of increase in the working steam pressure is about one-half completed; 42 feed water regulators have been ordered to be installed on the boilers in order to provide automatic regulation of the feed water, which will result in more efficient operation of the boilers and auxiliaries.

At the Central Power Station two coal bridges have been constructed, with a capacity of handling 125 tons of coal per hour. One of these bridges is in operation and the second is under way. The slip on the north side of the station was redredged to provide for the entrance of barges in connection with the proposed storage of coal on the north side of the slip.

The Richmond Hill Substation was increased from 2,000 K.W. to 3,500 K.W.; the Corona Substation from 1,500 K.W. to 2,000 K.W.; the Essex Street Substation from 3,000 K.W. to 5,000 K.W.; the Parkville Substation from 4,000 K.W. to 6,000 K.W.—part of these increases in capacity being provided by transfer of rotaries from other substations.

Additional switchboard panels have been installed in the Tompkins and Myrtle Substations, and additional switchboard equipment has been ordered for the Coney Island Substation.

During the year there were removed from the system 49.71 miles of overhead direct current feeders, of which 11.02 miles were reinstalled in other parts of the system; 25.09 miles of underground feeders were removed, and 14.69 miles reinstalled in other parts of the system.

There were renewed 97.40 miles of trolley wire, and 1,309 feet of conduit line were constructed on Avenue H from the Brighton Beach line to Ocean Avenue.

There were 862 trolley poles installed during the year; 419 removed; 181 reset; 375 reinforced, and 2,480 repainted.

On May 4, 1917, the surface railroad operating headquarters at Ridgewood were transferred to the new terminal at Fresh Pond Road, and the former property is available for sale.

Various improvements and repairs were made in buildings and other structures.

Approximately 11½ miles of surface track were reconstructed, involving the entire removal of the old track structure and foundation, and its replacement with new 7-inch standard grooved girder rail, on wood ties, with cast welded joints and tie rods, and the installation of new pavement on concrete foundation.

The surface track overhauled and repaved amounted to 12,652 lineal feet of single track.

The new lines of surface track constructed during the year aggregated 56,465 feet measured as single track. This construction was at the following locations:

Palmetto St., St. Nicholas Ave. to Myrtle Ave.	944 ft.
Flatbush Ave., Ave. N to Ave. U	8,673 "
Eighth Ave., 39th St. to Bay Ridge Ave.	15,432 "
Fresh Pond Rd., Lutheran Line to Metropolitan Ave.	3,652 "
Metropolitan Ave., Dry Harbor Rd. to Jamaica Ave.	18,041 "
Surf Ave., West 8th St. to West 5th St.	591 "
New 110th St., Brighton Beach	4,932 "
Line on Ralph, Mill and Kemble Aves. to Atlantic Gulf and Pacific Co.'s plant.	4,200 "

With the exception of the new street at Brighton Beach and the line leading to the Atlantic Gulf and Pacific Company at Mill Island, the above construction was 7-inch grooved girder rail with sheet asphalt pavement on Surf Avenue, 5-inch granite block pavement with sand foundation on Flatbush Avenue, and standard 5-inch granite on concrete foundation on the remainder of the lines.

We renewed city streets to the extent of 122,111 square yards of pavement, divided as follows:

New granite on concrete	74,758 square yards
New granite on sand	4,903 "
Recut granite on concrete	12,589 "
Recut granite on sand	3,907 "
Wood block	11,234 "
Sheet asphalt	14,720 "
	122,111 "

Twenty-one pieces of surface track special work were installed; 75 renewed, and 33 repaired. Twelve electric switches were installed.

The single track on Adams Street, north of Front Street, comprising 230 lineal feet, was removed; also approximately 2,640 feet of single track from property conveyed to the Brighton-by-the-Sea at Brighton Beach.

A dump track for disposal of snow was installed at the dock at the foot of Fulton Street.

Surface storage tracks were removed from the storage yard at Ocean Avenue and Avenue Z, upon expiration of the lease of that property.

The new drawbridge over Coney Island Creek at Stillwell Avenue and the connecting tracks were placed in operation.

On the elevated lines 16,862 lineal feet of structure were repainted; 21,998 ties were renewed, besides 106,832 lineal feet of guard rail, and 58,170 lineal feet of footwalk.

The rail and special work renewals on the elevated lines consisted of renewing 41,426 feet of 80-lb. running rail; 4,488 feet of 100-lb. running rail; 702 feet of guard rail, besides various frogs and switches.

The equipment of all surface passenger cars with air brakes required by order of the Public Service Commission was completed with the installation of 128 complete and 122 partial air brake equipments on double-track open cars; there were also installed 24 geared hand brakes, completing this installation.

Whiting electrically driven cranes were installed on three cars, displacing derricks and pillar cranes.

Considerable work was done in the repairing, repainting and overhauling of equipment, the number of surface cars passing through the shops for this purpose, or for damage in operation, being 3,280, and number of elevated and subway cars 1,184.

For experimental purposes four surface passenger cars were equipped with enclosed platforms, the doors of which are interlocked with the power control of the car.

Various machinery was added to the shop equipment.

Three hundred pairs of Brill 22-E maximum traction trucks were equipped with inside hung brake riggings, and 87 pairs of the same class of trucks on cars of the Coney Island & Brooklyn Railroad Company were equipped with fixed wheel guards.

## INCREASE IN NUMBER OF STOCKHOLDERS.

The number of stockholders at the date of closing the books for dividends in June, 1917, was 9,187, an increase of 149 as compared with the similar date of 1916.

## RESERVE ACCOUNTS.

Reserves have been added to during the year as follows:

Insurance	\$59,836.84
Amortization of Capital, etc.	173,229.61
Employer's Liability	90,451.23
Total	\$323,517.68

As against these additions, however, payments have been made on account of Employer's Liability amounting to \$20,522.55, and charges to Amortization of Capital, etc., on account of property retired, aggregate \$474,807.12, thereby reducing the accumulated reserves as shown in the balance sheet by \$171,811.99. The adjustments for property retired (which are reflected both in this statement, in the direct charges to profit and loss, and in the capital accounts) are somewhat abnormal, being increased considerably by the discarding of obsolete power house equipment, no longer required transmission lines and by the removal of car fenders.

## CONSTRUCTION EXPENDITURES.

On account of the construction and equipment of rapid transit lines under contract with the City, the New York Municipal Railway Corporation has expended during the year an additional amount of \$9,146,736.03, making the total expenditures to June 30, 1917, as follows:

On account of contribution to City-owned lines	\$11,149,308.00
On account of equipment of City-owned lines	8,373,233.79
On account of additions, extensions and improvements of existing railroads	30,458,769.53
Total	\$49,981,311.32

The other companies of the system have expended during the year for additions and improvements \$1,249,326.53, of which \$546,824.33 was for track and roadway (including extensions), \$122,772.71 for electric line, \$256,318.12 for power plant, \$174,657.27 for cars and electrical equipment, \$72,581.20 for buildings and fixtures, \$48,608.43 for real estate, and the remainder for miscellaneous purposes. As against these charges, however, credits have been made for properties displaced aggregating in value

\$957,200.82, leaving a net addition to the property accounts of other companies \$292,125.71.

#### BROOKLYN RAPID TRANSIT REFUNDING MORTGAGE FOUR PER CENT. BONDS.

Authenticated to July 1, 1916..... \$55,705,000.00  
Authenticated during year..... 223,000.00

Converted into stock..... \$55,928,000.00  
..... 29,619,000.00

Net Authenticated and Outstanding..... \$26,309,000.00

In hands of the Public..... \$3,459,000.00  
In possession of the B. R. T. System..... \$22,850,000.00

As follows:

\*Collateral to \$60,000,000.00 6 yr. 5 per cent. Notes..... \$10,000,000.00  
Collateral to Bills Payable..... 6,690,000.00  
In Treasury B. R. T..... 4,583,000.00  
In Treasury N. E. R. R..... 587,000.00

Deposited with City of New York by The N. E. R. R. Co..... 15,000.00  
Deposited with Trustee of The Nassau Electric Railroad Consolidated Mortgage..... 725,000.00  
Guaranty Fund Brooklyn City Railroad Lease..... 250,000.00  
\$22,850,000.00

\*\$2,265,000 par value of these notes have been converted into New York Municipal Railway Corporation's five per cent. first mortgage bonds, as permitted, prior to January 1, 1916, by the terms of the trust agreement. Detailed statements of operation, various statistics and consolidated balance sheet are appended hereto.

The Board of Directors desires to express its appreciation of the loyalty and efficiency of its employees during the past year, particularly in view of the trying conditions of the times through which we are passing.

By order of the Board,

T. S. WILLIAMS,  
President.

### CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY—SIXTY-THIRD ANNUAL REPORT

Chicago, January 1, 1917.

To the Stockholders of the Chicago, Burlington & Quincy Railroad Company:

As of July 1, 1916, there was issued the Sixty-Second Annual Report of your Company, covering the year ended June 30, 1916. Since then the Interstate Commerce Commission has changed its fiscal year for which carriers are required to make reports, to end December 31 instead of June 30 as heretofore. A similar change in the fiscal year has been made by most of the railroads of the country and your directors took similar action at meeting held January 24, 1917.

It has seemed best, for purpose of future comparisons, to make this report cover the fiscal year ended December 31, 1916, and the figures are so presented herein. There are included, however, for the six months period ended December 31, 1916, an Income Account Statement, and tables showing Changes in Equipment, Revenue Freight Carried and Investment in Road and Equipment.

#### COMPARATIVE INCOME STATEMENT, YEARS ENDED DECEMBER 31.

Per Cent.	1916	OPERATING REVENUES.	1915	Per Cent.
70.80	\$ 77,310,516.00	Freight .....	\$ 64,211,845.33	68.61
20.00	21,833,534.25	Passenger .....	20,438,621.92	21.84
2.47	2,691,304.66	Mail .....	2,593,884.14	2.77
2.61	2,854,713.02	Express .....	2,436,064.43	2.60
2.06	2,250,015.47	Miscellaneous .....	1,983,640.41	2.12
1.97	2,149,529.24	Incidental .....	1,847,742.06	1.98
.09	101,591.85	Joint facility .....	77,924.14	.08
100.00	\$109,191,204.49	Total operating revenue...	\$ 93,589,722.43	100.00

#### OPERATING EXPENSES.

Per Cent.	1916	OPERATING EXPENSES.	1915	Per Cent.
11.17	\$ 12,203,996.81	Maintenance of way and structures .....	\$ 12,025,216.06	12.85
15.62	17,053,851.51	Maintenance of equipment .....	14,833,787.07	15.85
1.52	1,662,805.07	Traffic .....	1,577,138.03	1.69
29.32	32,014,949.04	Transportation .....	28,810,984.20	30.79
.93	1,013,164.78	Miscellaneous operations .....	846,608.48	.90
2.02	2,203,307.74	General .....	2,033,345.36	2.17
Cr..84	Cr. 916,370.29	Transportation for investment—Cr. ....		
59.74	\$ 65,235,704.66	Total operating expenses ..	\$ 60,127,079.20	64.25

40.26	\$ 43,955,499.83	Net operating revenue ..	\$ 33,462,643.23	
	\$ 4,820,197.37	Railway tax accruals ..	\$ 4,262,551.56	
	36,314.88	Uncollectible railway revenues ..	24,157.35	
	\$ 4,856,512.25		\$ 4,286,708.91	
	\$ 39,098,987.58	Operating income .....	\$ 29,175,934.32	

#### NONOPERATING INCOME.

	\$ 1,578,114.13	Rents .....	\$ 925,698.49	
	1,413,202.63	Miscellaneous interest ..	379,168.88	
	\$ 2,991,316.76	Total nonoperating income ..	\$ 1,304,867.37	
	\$ 42,090,304.34	Gross income .....	\$ 30,480,801.69	

#### DEDUCTIONS FROM GROSS INCOME.

	\$ 2,065,577.91	Rents .....	\$ 1,629,870.64	
	6,966,493.46	Interest on funded debt ..	7,077,551.97	
	752.94	Interest on unfunded debt ..	6,072.27	
	55,163.52	Amortization of discount on funded debt ..	82,592.32	
	13,590.86	Miscellaneous income charges ..	12,822.16	
	\$ 9,095,578.69	Total deductions .....	\$ 8,808,909.36	
	\$ 32,994,725.65	Net income .....	\$ 21,671,892.33	

#### DISPOSITION OF NET INCOME.

Appropriations for:			
	\$ 1,864,286.81	Sinking funds .....	\$ 1,783,800.38
	8,867,128.00	Dividends .....	8,867,128.00
	8,864,595.48	Additions and betterments ..	3,340,669.28
	2,400,000.00	Fund for accrued taxes not yet due ..	
	6,000,000.00	Miscellaneous appropriations of income ..	
	\$ 27,996,010.29		\$ 13,991,597.66
	\$ 4,998,715.36	Income balance .....	\$ 7,680,294.67

#### CAPITALIZATION.

##### CAPITAL STOCK.

Number of Shares.	Total Par Value Authorized and Outstanding.	Dividends Declared During the Year.
1,108,391	\$110,839,100.00	Rate. 8% Amount. \$8,867,128.00
The capital stock outstanding remained without change during the year.		

##### FUNDED DEBT.

Nominally Issued.	Actually Issued.			Interest Accrued During Year on Bonds "Actually Outstanding."
	Reacquired	In Sinking Funds.	Actually Outstanding.	
In Treasury.	In Treasury.	Pledged.		
\$9,873,000	\$3,885,400	\$31,000	\$23,466,700	\$176,487,900
The funded debt outstanding was reduced \$4,838,000. This reduction was held in the treasury..... \$2,952,500				
held by Trustees of sinking funds..... 1,319,500				
canceled and retired..... 566,000				
\$4,838,000				

##### MILEAGE.

##### MILEAGE OF ROAD OPERATED ON DECEMBER 31, 1916.

STATE	Line Owned			Operated Under Lease or Contract.	Total Mileage Operated.
	Main Line.	Branches and Spurs.	Total.		
Colorado .....	214.11	180.25	394.36	34.97	429.33
Illinois .....	891.48	783.53	1,675.01	114.06	1,789.07
Iowa .....	371.68	993.44	1,365.12	73.44	1,438.56
Kansas .....	12.71	246.61	259.32	.82	260.14
Minnesota .....	23.61		23.61	14.84	38.45
Missouri .....	593.62	528.68	1,122.30	13.15	1,135.45
Montana .....	134.38		134.38	49.54	183.92
Nebraska .....	1,364.76	1,485.58	2,850.34	22.37	2,872.71
South Dakota ..	48.88	231.07	279.95		279.95
Wisconsin .....	222.33		222.33	.53	222.86
Wyoming .....	571.54	120.91	692.45	30.76	723.21
Total .....	4,449.10	4,570.07	9,019.17	354.48	9,373.65

##### LINE OWNED.

STATE.	Miles of Road.	Second Track.	Third Track.	Yard Track and Sidings.	Total.
Colorado .....	394.36			144.82	539.18
Illinois .....	1,675.01	412.94	42.40	992.22	3,122.57
Iowa .....	1,365.12	243.55		353.38	1,962.05
Kansas .....	259.32			25.05	284.37
Minnesota .....	23.61	2.25		37.13	62.99
Missouri .....	1,122.30	112.12		434.78	1,669.20
Montana .....	134.38			34.91	169.29
Nebraska .....	2,850.34	17.96		719.20	3,587.50
South Dakota ..	279.95			62.62	342.57
Wisconsin .....	222.33	136.65		76.84	435.82
Wyoming .....	692.45			212.51	904.96
Total .....	9,019.17	925.47	42.40	3,093.46	13,080.50

The increases during the year were:

in road owned..... 3.45 miles  
in line operated..... .40 miles

##### TAXES.

	1916.	1915.	Increase or Decrease.
Colorado .....	\$ 299,308.12	\$ 260,248.06	Inc. \$ 39,060.06
Illinois .....	1,007,460.77	996,333.36	Inc. 11,127.41
Iowa .....	550,365.16	554,041.13	Dec. 3,675.97
Kansas .....	80,220.64	67,211.30	Inc. 13,009.34
Minnesota .....	32,604.31	32,528.25	Inc. 76.06
Missouri .....	296,094.75	403,578.10	Dec. 107,483.35
Montana .....	58,124.72	72,670.50	Dec. 14,545.78
Nebraska .....	1,074,782.38	1,079,838.13	Dec. 5,055.75
South Dakota ..	166,068.03	108,277.83	Inc. 57,790.20
Wisconsin .....	255,473.54	265,206.08	Dec. 9,732.54
Wyoming .....	309,444.33	206,803.24	Inc. 102,641.09
Other States .....	199.51	280.55	Dec. 81.04
Total States .....	\$4,130,146.26	\$4,047,016.53	Inc. \$83,129.73
United States Government...	\$690,051.11	\$215,535.03	Inc. \$474,516.08

Grand Total .....

\$4,820,197.37	\$4,262,551.56	Inc. \$557,645.81
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The large increase in the United States government tax was due principally to the change of rate from one per cent to two per cent of the net income.



## STATISTICS OF OPERATIONS.

The large increase in Operating Revenues, and the increased efficiency of operation, resulted in reducing the operating ratio from 64.25 in 1915 to 60.58 in 1916. This operating ratio of 1916 was further reduced to 59.74 by the deduction from Operating Expenses of the credit for "Transportation for Investment" (a recent requirement by the Interstate Commerce Commission.)

Increased efficiency of operation is shown by an increase of 22.7% in ton miles of revenue freight being carried with increases of only 11.7% in freight train miles and of 10.8% in freight train car miles.

## STATISTICS OF OPERATIONS.

ITEM.	1916.	1915.	Increase or Decrease.	
Average mileage of road operated (miles).....	9,370.39	9,368.00	Inc.	2.39
TRAIN-MILES.				
Freight—ordinary .....	18,185,157	16,282,873	Inc.	1,902,284
“ —light .....	124,153	111,143	Inc.	13,010
“ —total .....	18,309,310	16,394,016	Inc.	1,915,294
Passenger .....	17,965,959*	17,714,045	Inc.	251,914
Mixed .....	697,909	745,955	Dec.	48,046
Special .....	23,065	35,199	Dec.	12,134
Total transportation service.....	36,996,243	34,889,215	Inc.	2,107,028
Work service .....	864,423	876,051	Dec.	11,628
LOCOMOTIVE-MILES.				
Freight—principal .....	18,331,202	16,411,285	Inc.	1,919,917
“ —helper .....	824,914	675,270	Inc.	149,644
“ —light .....	876,031	767,720	Inc.	108,311
“ —total .....	20,032,147	17,854,275	Inc.	2,177,872
Passenger—principal .....	17,901,359	17,649,101	Inc.	252,258
“ —helper .....	133,119	201,075	Dec.	67,956
“ —light .....	336,858	354,349	Dec.	17,491
“ —total .....	18,371,336	18,204,525	Inc.	166,811
Mixed train—principal .....	698,060	746,059	Dec.	47,999
“ —helper .....	1,265	3,236	Dec.	1,971
“ —light .....	5,819	5,994	Dec.	175
“ —total .....	705,144	755,289	Dec.	50,145
Special—principal .....	23,070	35,199	Dec.	12,129
“ —helper .....	1,820	5,363	Dec.	3,543
“ —light .....	793	2,996	Dec.	2,203
“ —total .....	25,683	43,558	Dec.	17,875
*Includes 64,600 motor train miles.				
Train switching .....	1,098,367	1,016,172	Inc.	82,195
Yard switching—freight .....	9,458,909	8,049,742	Inc.	1,409,167
“ —passenger .....	668,073	656,343	Inc.	11,730
“ —total .....	10,126,982	8,706,085	Inc.	1,420,897
Total transportation service .....	50,359,659	46,579,904	Inc.	3,779,755
Work service .....	1,592,852	1,628,187	Dec.	35,335
LOCOMOTIVE TON-MILES.				
Freight train service.....	3,041,175,324			
Mixed train service .....	34,266,388			
Passenger train service.....	1,687,271,789			
Special train service .....	2,513,066			
Total transportation service.....	4,765,226,567			
CAR-MILES.				
Freight train—loaded .....	529,042,014	454,886,356	Inc.	74,155,658
“ —empty .....	213,131,101	215,377,659	Dec.	2,246,558
Sum of loaded and empty.....	742,173,115	670,264,015	Inc.	71,909,100
Freight train—caboose .....	18,548,221	16,604,846	Inc.	1,943,375
“ —total .....	760,721,336	686,868,861	Inc.	73,852,475
Passenger train—passenger .....	45,919,278†	44,958,989	Inc.	960,289
“ —sleeping, parlor and observation.....	28,220,580	29,805,419	Dec.	1,584,839
“ —dining .....	4,958,023	4,987,581	Dec.	29,558
“ —other .....	38,203,438	36,199,709	Inc.	2,003,729
“ —total .....	117,301,319†	115,951,698	Inc.	1,349,621
Mixed train—freight, loaded .....	3,135,961	3,042,826	Inc.	93,135
“ —freight, empty .....	1,032,206	1,158,933	Dec.	126,727
“ —caboose .....	34,819	30,724	Inc.	4,095
“ —passenger .....	1,184,995	1,232,510	Dec.	47,515
“ —sleeping, parlor and observation.....	73,042	2,580	Inc.	70,462
“ —dining .....	106	106	Dec.	106
“ —other passenger—train .....	296,594	356,891	Dec.	60,297
“ —total .....	5,757,617	5,824,570	Dec.	66,953
† Includes 64,600 motor car miles.				
Special train—freight—loaded .....	284,393	297,077	Dec.	12,684
“ —freight—empty .....	46,868	15,206	Inc.	31,662
“ —caboose .....	21,688	30,351	Dec.	8,663
“ —passenger .....	99,264	103,742	Dec.	4,478
“ —sleeping, parlor and observation.....	152	13,919	Dec.	13,767
“ —dining .....	59	2,639	Dec.	2,580
“ —other passenger—train .....	1,117	8,131	Dec.	7,014
“ —total .....	453,541	471,065	Dec.	17,524
Total transportation service .....	884,233,813	809,116,194	Inc.	75,117,619
Work service .....	3,568,785	4,018,593	Dec.	449,808
FREIGHT SERVICE.				
Tons—revenue freight .....	39,278,135	32,996,554	Inc.	6,281,581
“ —non-revenue freight .....	9,052,606	8,996,409	Inc.	56,197
“ —total .....	48,330,741	41,992,963	Inc.	6,337,778

## STATISTICS OF OPERATIONS (Continued).

	1916.	1915.	Increase or Decrease.
Ton miles—revenue freight .....	10,923,326,440	8,899,951,312	Inc. 2,023,375,128
" miles—non-revenue freight .....	1,814,590,652	1,675,195,298	Inc. 139,395,354
" miles—total .....	12,737,917,092	10,575,146,610	Inc. 2,162,770,482

## PASSENGER SERVICE.

Passengers carried—revenue .....	22,879,435	22,728,128	Inc. 151,307
Passenger miles—revenue .....	1,097,092,168	1,111,848,183	Dec. 14,756,015

## REVENUES AND EXPENSES.

Freight revenue .....	\$77,310,516.00	\$64,211,845.33	Inc. \$13,098,670.67
Passenger revenue .....	21,833,534.25	20,438,621.92	Inc. 1,394,912.33
Passenger service train revenue .....	28,133,797.61	26,130,477.74	Inc. 2,003,319.87
Operating revenues .....	\$109,191,204.49	\$93,589,722.43	Inc. \$15,601,482.06
expenses .....	65,235,704.66	60,127,079.20	Inc. 5,108,625.46
Net operating revenues .....	\$43,955,499.83	\$33,462,643.23	Inc. \$10,492,856.60

## AVERAGES PER MILE OF ROAD.

Freight-train miles .....	1,954	1,750	Inc.	204
Passenger-train miles .....	1,917	1,891	Inc.	26
Mixed-train miles .....	74	80	Dec.	6
Special-train miles .....	2	3	Dec.	1
Transportation service train-miles .....	3,947	3,724	Inc.	223
Work-train miles .....	92	94	Dec.	2
Locomotive-miles—transportation .....	5,374	4,972	Inc.	402
Freight service car-miles .....	81,670	73,809	Inc.	402
Passenger service car-miles .....	12,695	12,561	Inc.	134
Freight revenue .....	\$ 8,250.51	\$ 6,854.38	Inc.	\$1,396.13
Passenger service train revenue .....	3,002.41	2,789.33	Inc.	213.08
Operating revenues .....	11,652.79	9,990.36	Inc.	1,662.43
expenses .....	6,961.90	6,418.35	Inc.	543.55
Net operating revenues .....	4,690.89	3,572.01	Inc.	1,118.88
Ton-miles—revenue freight .....	1,165,728	950,038	Inc.	215,690
" —all freight .....	1,359,380	1,128,859	Inc.	230,521
Passenger-miles—revenue .....	117,081	118,686	Dec.	1,605

Coal cars .....	22,971	78	22,893	.....
Tank cars .....	213	.....	213	.....
Refrigerator cars .....	2,943	32	2,911	.....
Caboose cars .....	693	15	679	.....
Other freight-train cars .....	80	1	79	.....

All classes of freight-train cars .....	66,547	1,605	1,926	66,226	41,05 tons
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Passenger-train cars:					
Coaches .....	659	28	14	673	.....
Combination passenger cars .....	146	14	6	154	.....
Other combination cars .....	107	2	1	108	.....
Dining cars .....	41	.....	.....	41	.....
Parlor cars .....	14	.....	.....	14	.....
Baggage and express cars .....	215	7	1	221	.....
Postal cars .....	48	5	5	48	.....
Other passenger-train cars .....	39	.....	.....	39	.....

All classes of passenger-train cars .....	1,269	56	27	1,298	.....
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Company service cars:					
Officers' and pay cars .....	31	16	.....	47	.....
Ballast cars .....	2,493	101	291	2,303	.....
Derrick cars .....	24	.....	2	22	.....
Steam shovels .....	19	.....	.....	19	.....
Wrecking cars .....	17	.....	.....	17	.....
Other company service cars .....	2,577	426	215	2,788	.....

All classes of company service cars .....	5,161	543	508	5,196	.....
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All classes of cars in service .....	72,977	2,204	2,461	72,720	.....
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Floating equipment:					
Steamboats and tugboats .....	3	1	.....	4	.....
Barges, car floats and canal boats .....	58	2	2	58	.....
Other floating equipment .....	11	.....	.....	11	.....

Total floating equipment .....	72	3	2	73	.....
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## REVENUE FREIGHT CARRIED DURING THE YEAR.

COMMODITIES.	Number of Tons Originating on this Road.	Number of Tons Received from Connecting Carriers.	TOTAL.	Per cent of Whole.
Products of Agriculture—				
Grain .....	4,561,415	883,414	5,444,829	13.9
Flour .....	470,116	216,110	686,226	1.7
Other mill products .....	221,235	49,921	271,156	.7
Hay .....	243,558	59,687	303,245	.8
Tobacco .....	2,954	3,966	6,920	.....
Cotton .....	5,001	56,733	61,734	.1
Fruits and vegetables .....	650,818	721,207	1,372,025	3.5
Other products .....	144,891	117,368	262,259	.7
Total .....	6,299,988	2,108,406	8,408,394	21.4

Products of Animals—				
Live stock .....	1,786,534	306,117	2,092,651	5.3
Dressed meats .....	226,030	9,207	235,237	.6
Other packinghouse products .....	117,204	10,513	127,717	.3
Poultry, game and fish .....	74,048	58,133	132,181	.3
Wool .....	7,921	9,642	17,563	.1
Hides and leather .....	23,492	5,817	29,309	.1
Other products .....	83,097	37,887	120,984	.3
Total .....	2,318,326	437,316	2,755,642	7.0

Products of mines—				
Anthracite coal .....	13,829	109,265	123,094	.3
Bituminous coal .....	9,643,139	2,086,771	11,729,910	29.8
Coke .....	48,417	213,562	261,979	.7
Ores .....	126,725	547,098	673,823	1.7
Stone, sand, etc. ....	1,993,376	351,346	2,344,722	6.0
Other products .....	135,518	362,377	497,895	1.3
Total .....	11,961,004	3,670,419	15,631,423	39.8

Products of Forests—				
Lumber .....	283,474	1,682,629	1,966,103	5.0
Other products .....	121,066	107,397	228,463	.6
Total .....	404,540	1,790,026	2,194,566	5.6

## AVERAGES PER TRAIN-MILE.

Loaded freight car-miles—freight trains .....	28.89	27.75	Inc.	1.14
Loaded freight car-miles—mixed trains .....	4.49	4.08	Inc.	.41
Empty freight car-miles—freight trains .....	11.64	13.14	Dec.	1.50
Empty freight car-miles—mixed trains .....	1.48	1.55	Dec.	.07
Ton-miles—revenue freight .....	574.69	519.25	Inc.	55.44
" —all freight .....	670.16	616.99	Inc.	53.17
Passenger train car-miles—passenger trains .....	6.53	6.55	Dec.	.02
Passenger train car-miles—mixed trains .....	2.23	2.13	Inc.	.10
Revenue passenger-miles .....	58.78	60.23	Dec.	1.45
Freight revenue .....	\$ 4.07	\$ 3.75	Inc.	\$ .32
Passenger service train revenue .....	1.51	1.42	Inc.	.09
Operating revenues .....	2.95	2.68	Inc.	.27
expenses .....	1.76	1.72	Inc.	.04
Net operating revenues .....	1.19	.96	Inc.	.23

## AVERAGES PER LOCOMOTIVE-MILE.

ITEM.	1916.	1915.	Increase or Decrease.
Train-miles—freight trains .....	.91	.92	Dec. .01
Car-miles—freight trains .....	37.98	38.47	Dec. .49
Train-miles—passenger trains .....	.98	.97	Inc. .01
Car-miles—passenger trains .....	6.39	6.35	Inc. .04
Train-miles—mixed trains .....	.99	.99	.....
Car-miles—mixed trains .....	8.17	7.71	Inc. .46
Train-miles—special trains .....	.90	.81	Inc. .09
Car-miles—special trains .....	17.66	10.81	Inc. 6.85

## AVERAGES PER LOADED FREIGHT CAR-MILE.

Ton-miles—revenue freight .....	20.53	19.44	Inc.	1.09
" —all freight .....	23.94	23.09	Inc.	.85
Freight revenue .....	\$ .14527	\$ .14022	Inc.	\$ .00505

## AVERAGES PER CAR-MILE—PASSENGER.

Passenger-miles—revenue .....	14.55	14.63	Dec.	.08
Passenger revenue .....	\$ .28958	\$ .26972	Inc.	\$ .01986

## MISCELLANEOUS AVERAGES.

Miles hauled—revenue freight .....	278.10	269.72	Inc.	8.38
" —non-revenue freight .....	200.45	186.21	Inc.	14.24
" —all freight .....	263.55	251.83	Inc.	11.72
Miles carried—revenue passengers .....	47.95	48.92	Dec.	.97
Revenue per ton of freight .....	\$1.96828	\$1.94602	Inc.	\$ .02226
" ton-mile of freight .....	.00708	.00721	Dec.	.00013
" passenger .....	.95429	.89927	Inc.	.05502
" passenger-mile .....	.01990	.01838	Inc.	.00152
Operating ratio .....	% 59.74	% 64.25	Dec.	% 4.51

## EQUIPMENT.

CLASS OF EQUIPMENT.	Number on Dec. 31, 1915.	Number Added During Year.	Number Retired During Year.	Number On Dec. 31, 1916.	Average Tractive Power All Locomotives and Average Capacity All Freight Cars.
Steam locomotives .....	1,767	1	22	1,746	31,515 lbs.
Freight-train cars:					
Box cars .....	30,429	1,359	1,334	30,454	.....
Flat cars .....	1,549	.....	13	1,536	.....
Stock cars .....	7,669	245	453	7,461	.....



<b>Manufactures—</b>				
Petroleum and other oils.....	706,301	433,379	1,139,680	2.9
Sugar .....	198,747	156,136	354,883	.9
Naval stores .....	11,901	6,217	18,118	.....
Iron, pig and bloom.....	25,990	188,745	214,735	.6
Iron and steel rails.....	17,852	147,295	165,147	.4
Other castings and machinery..	178,809	286,190	464,999	1.2
Bar and sheet metal.....	80,588	326,609	407,197	1.0
Cement, brick and lime.....	1,401,654	522,789	1,924,443	4.9
Agricultural implements.....	181,032	66,902	247,934	.6
Wagons, carriages, tools, etc..	58,262	124,887	183,149	.5
Wines, liquors and beers.....	152,279	48,779	201,058	.5
Household goods etc.....	61,716	47,216	108,932	.3
Other manufactures .....	565,222	701,699	1,266,921	3.2
<b>Total .....</b>	<b>3,640,353</b>	<b>3,056,843</b>	<b>6,697,196</b>	<b>17.0</b>
Miscellaneous .....	800,574	283,331	1,083,905	2.8
Less Car Load.....	1,733,346	773,663	2,507,009	6.4
<b>Grand Total, All Commodities..</b>	<b>27,158,131</b>	<b>12,120,004</b>	<b>39,278,135</b>	<b>100.0</b>

There was an increase of 6,281,581 tons, 19.04%, in revenue freight carried, of which 4,687,982 tons, an increase of 20.86%, was in freight originating on this road, and 1,593,599 tons, an increase of 15.14%, in freight received from connecting carriers.

The principal increases were in grain, live stock, bituminous coal and in petroleum and other oils. The increase in grain was 1,309,370 tons, 31.66%, of which 1,102,112 tons, an increase of 31.86%, originated on this road. The increase in live stock was 205,468 tons, 10.89%, of which 166,124 tons, an increase of 10.25%, originated on this road. The increase in bituminous coal was 1,995,469 tons, 20.50%, of which 1,854,056 tons, an increase of 23.80% originated on this road. The increase in petroleum and other oils was 386,011 tons, 51.22%, of which 340,166 tons, increase 92.91%, originated on this road.

The increase in bituminous coal was due to some extent to our reaching new mines, but principally to the fact that last year eastern coal found its market in the east to a much greater extent than in former years, due to increased demand from industries for coal; also increased export and tide-water movement. The car situation and serious congestion in the east also militated against free movement to western territory, resulting in greatly increased demands for western and Illinois coal.

The increase in petroleum and its products was due principally to increased oil development in the Wyoming fields served by this Company. This tonnage has developed satisfactorily.

#### INVESTMENT IN ROAD AND EQUIPMENT DURING THE YEAR.

ACCOUNT.	New Lines and Extensions.	Additions and Betterments charged to Road and Equipment.		Total.
		Appropriated from Income.		
Engineering .....	\$11,027.30	\$143,054.91		\$154,082.21
Land for transportation purposes.....	Cr. 5,668.12	\$282,962.58		277,294.46
Grading .....	197,889.53	927,500.17		1,125,389.70
Tunnels and subways .....	26,715.40			26,715.40
Bridges, trestles and culverts .....	225,890.01	838,013.04		1,063,903.05
Ties .....	20,661.99	268,362.56		289,024.55
Rails .....	33,106.44	563,043.64		596,150.08
Other track material.....	18,610.61	466,828.28		485,438.89
Ballast .....	12,497.45	209,143.21		221,640.66
Track laying and surfacing .....	44,294.19	331,992.16		376,286.35
Right-of-way fences..	6,468.11	36,831.18		43,299.29
Snow and sand fences and snow sheds .....	886.63	2,993.95		3,880.58
Crossings and signs.....	7,156.11	157,439.39		164,595.50
Station and office buildings .....	25,099.55	236,703.08		261,802.63
Roadway buildings.....	637.30	3,014.36		3,651.66
Water stations.....	3,172.58	114,751.20		117,923.78
Fuel stations.....	Cr. 422.92	44,615.91		44,192.99
Sheds and engine-houses .....	Cr. 20,553.13	933,401.78		912,848.65
Storage warehouses.....		518.87		518.87
Wharves and docks.....		10,967.13		10,967.13
Telegraph and telephone lines.....	2,327.36	25,856.69		28,184.05
Signals and interlockers .....	338.34	332,967.77		333,306.11
Power plant buildings.....		71,619.96		71,619.96
Miscellaneous structures .....	17.58	93,635.10		93,652.68
Paving .....		Cr. 7,009.35	Cr. 7,009.35	
Roadway machines.....		9,645.21		9,645.21
Roadway small tools.....		467.18		467.18
Assessments for public improvements.....		136,604.59		136,604.59

Other expenditures—			
Road .....	6,136.91	538,106.72	544,243.63
Shop machinery.....		77,359.24	77,359.24
Power plant machinery .....		104,569.44	104,569.44
Unapplied construction material and supplies.....			
<b>Total expenditures for road.....</b>	<b>\$616,289.22</b>	<b>\$282,962.58</b>	<b>\$6,706,409.84</b>
Steam locomotives.....		Cr. 126,799.96	Cr. 126,799.96
Freight-train cars.....		417,389.63	417,389.63
Passenger-train cars.....		445,921.27	445,921.27
Floating equipment.....			
Work equipment.....		102,077.16	102,077.16
Miscellaneous equipment .....		895.60	895.60
<b>Total expenditures for equipment.....</b>	<b>\$834,021.26</b>	<b>\$834,021.26</b>	
Law .....	\$100.00		\$100.00
Interest during construction .....	36,353.57	137,147.77	173,501.34
Other expenditures—			
General .....	2,750.00		2,750.00
<b>Total general expenditures .....</b>	<b>39,203.57</b>	<b>137,147.77</b>	<b>176,351.34</b>
<b>Grand Total.....</b>	<b>\$655,492.79</b>	<b>\$282,962.58</b>	<b>\$7,677,578.87</b>

\* Of this amount \$1,175,999.31 was charged to previously appropriated surplus. The total of appropriations made as of June 30, 1916, and December 31, 1916, was (vide pages 5 and 23) \$8,864,595.48 which covered Additions and Betterments for 6 months to December 31, 1915, \$2,363,015.92, for 12 months to December 31, 1916, \$6,501,579.56.

During the year there was a further expenditure of \$94,680 for land for Chicago Terminals, making the total expended \$5,120,634.

For the reconstruction of the Missouri River bridge at Kansas City, there was expended during the year, \$711,179, of which \$694,338 was charged to Operating Expenses and the balance to Additions and Betterments. This makes the total expended to date \$1,012,768. It is estimated that charges subsequent to Jan. 1st, 1917, will amount to \$402,000, making the total cost for the bridge \$1,414,768.

There has been expended during the year for track elevation at Aurora, Ill., \$222,963, most of which was chargeable to Additions and Betterments, the total charge to date being \$1,003,584. The estimated further cost is \$2,061,592, making the estimate for completed work \$3,065,176.

The building of the new Chicago Union Passenger Station requires a rebuilding of your Company's freight terminals at Chicago, and during the year there was expended on temporary freight terminals \$161,860, and on the permanent work \$20,089.

During the year the work on new shops and additional tracks at West Burlington has been carried along at an expenditure of \$911,408, most of which was charged to Additions and Betterments. The estimated further cost is \$544,301, making the total estimated cost at completion, \$1,455,709.

Second track has been constructed during the year:

Steward Jct. to Flag Center, Ill.....	\$164,628
On Beardstown Division.....	525,740
On La Crosse Division.....	372,454
Forbes to Curzons.....	288,726

Making a total of..... \$1,351,548

and the estimated cost of completing these pieces of double track will bring the total to \$2,921,165.

Work has been continued on the Chalco-Yutan Cut-Off at an expenditure during the year of \$438,440, making the total expended to date \$638,216 and leaving an estimated further expenditure of \$130,000 to complete the work.

On New Line and necessary side tracks between Guernsey and Thermopolis, there has been expended \$335,824, making the total amount expended \$858,757, leaving an estimated expenditure of \$20,000 to complete the work.

As indicated, the operations reflected in the accompanying statements and report are those for the year ended December 31st, 1916, during part of which numerous items of expense have been affected by increased cost of materials and labor. These increases will affect the Operating Expenses throughout the whole of the year 1917; and there will be the large additional expenses now accruing through the increase in wages resulting from the "so-called" Adamson Law, effective Jan. 1st, 1917, and through increases in other wages which have been granted or are in process of negotiation. The 1917 figures will also reflect the more recent increases in cost of locomotive fuel and materials and supplies, accruing on account of economic and other conditions affecting the country as a result of the European War and conditions related thereto. Pending revenue measures likewise indicate a substantial increase in taxes payable during the coming year.

Following is the report of the General Auditor with statements prepared by him.

By Order of the Board of Directors,

HALE HOLDEN,  
President.

#### FUNDED DEBT OF THE CHICAGO, BURLINGTON & QUINCY RAILROAD COMPANY.

Designation of Bond or Obligation.	Term.		Total Par Value Authorized.	Total Nominally or Actually Outstanding.	Nominally Outstanding, Held by or for Company.			Actually Outstanding in Hands of Public.	Interest.		Accrued During Year on Bonds Actually Outstanding.
	Date of Issue.	Date of Maturity.			In Treasury.	Pledged as Collateral.	In Sinking Funds.		Rate.	When Payable.	
MORTGAGE BONDS.											
C. B. & Q. R. R.:											
General mortgage ..	Mar. 2, 1908	Mar. 1, 1958	\$ 75,120,000	\$ 75,120,000	\$ 9,873,000	.....	.....	\$65,247,000	4	M. & S.	\$2,609,880.00
Illinois Division...	July 1, 1899	July 1, 1949	50,835,000	50,835,000	384,000	.....	.....	50,451,000	3½	J. & J.	1,765,785.00
Illinois Division...	July 1, 1899	July 1, 1949	34,165,000	34,165,000	189,000	.....	.....	33,976,000	4	J. & J.	1,359,040.00
Iowa Div. mtge. sinking fund bonds...	Oct. 1, 1879	Oct. 1, 1919	3,000,000	1,944,000	79,000	.....	.....	1,865,000	5	A. & O.	95,840.56
Iowa Div. mtge. sinking fund bonds...	Oct. 1, 1879	Oct. 1, 1919	12,502,000	4,816,000	241,000	.....	.....	4,575,000	4	A. & O.	196,458.98
Nebraska ext. mtge. sink. fund bonds...	May 2, 1877	May 1, 1927	29,441,000	21,341,000	2,779,000	\$31,000	.....	18,531,000	4	M. & N.	816,393.44

## FUNDED DEBT OF THE CHICAGO, BURLINGTON &amp; QUINCY RAILROAD COMPANY—CONTINUED.

Designation of Bond or Obligation.	Term.		Total Par Value Authorized.	Total Nominally or Actually Outstanding.	Nominally Outstanding, Held by or for Company.			Actually Outstanding in Hands of Public.	Interest		
	Date of Issue.	Date of Maturity.			In Treasury.	Pledged as Collateral.	In Sinking Funds.		Rate.	When Payable.	Accrued During Year on Bonds Actually Outstanding.
MORTGAGE BONDS.											
B. & M. R. R. R. in Nebraska:											
Consol. mtge. sinking fund bonds .....	July 1, 1878	July 1, 1918	\$13,751,000	\$13,613,000	\$7,600	.....	\$12,782,400	\$823,000	6	J. & J.	\$60,503.96
Republican Valley R. R.:											
Mort. sinking fund bonds .....	July 1, 1879	July 1, 1919	1,078,000	932,800	2,200	.....	917,800	12,800	6	J. & J.	3,636.41
*Tarkio Valley R. R.:											
Mortgage bonds....	June 1, 1880	June 1, 1920	210,000	.....	.....	.....	.....	.....	7	J. & D.	701.74
*Nodaway Val. R. R.:											
Mortgage bonds ..	June 1, 1880	June 1, 1920	188,000	.....	.....	.....	.....	.....	.....	.....	.....
COLLATERAL TRUST BONDS.											
C. B. & Q. R. R.:											
Sinking fund bonds (Denver exten.)..	Dec. 1, 1881	Feb. 1, 1922	7,968,000	7,310,200	136,600	.....	6,220,500	953,100	7	J. & D.	577.71
									4	F. & A.	44,414.35
PLAIN BONDS.											
C. B. & Q. R. R.:											
Sinking fund bonds	Sept. 1, 1881	Sept. 1, 1921	4,300,000	3,667,000	67,000	.....	3,546,000	54,000	4	M. & S.	7,261.31
Total .....			\$232,558,000	\$213,744,000	\$13,758,400	\$31,000	\$23,466,700	\$176,487,900	...	.....	\$6,960,493.46

\*Note: These Bonds paid off and retired in December, 1916.

## GENERAL BALANCE SHEET.

December 31, 1916.

## ASSETS.

<b>Investments:</b>			
Property investment—Road and equipment:			
Road	\$373,469,973.19		
Equipment	79,495,314.91		
General expenditures	350,621.62	\$453,315,909.72	
Sinking funds:			
Book assets	\$23,469,723.71		
Par value of Company's own issues included	23,466,700.00	3,023.71	
Deposits in lieu of mortgaged property sold		229,613.05	
Miscellaneous physical property		1,463,710.90	
<b>Investments in affiliated companies:</b>			
Stocks	\$27,552,292.12		
Bonds	1,238,122.93		
Advances	1,797,535.34	30,587,950.39	
<b>Other investments:</b>			
Stocks	\$9,127.91		
Bonds	152,538.00		
Notes	166,671.54		
Miscellaneous	35.00	328,372.45	
<b>Total investments</b>		<b>\$485,928,580.22</b>	
<b>Current assets:</b>			
Cash	\$19,848,417.83		
Demand loans and deposits	25,000.00		
Time deposits	12,346,500.00		
Loans and bills receivable	4,318,801.21		
Traffic and car-service balances receivable	788,947.88		
Net balance receivable from agents and conductors	3,896,880.26		
Miscellaneous accounts receivable	2,900,219.54		
Material and supplies	7,571,610.83		
<b>Total current assets</b>		<b>\$51,696,377.55</b>	
<b>Deferred assets:</b>			
Working fund advances	\$26,114.38		
Other deferred assets	313,300.00		
<b>Total deferred assets</b>		<b>\$339,414.38</b>	
<b>Unadjusted debits:</b>			
Insurance premium paid in advance	\$36,646.51		
Discount on funded debt	2,270,913.56		
Other unadjusted debits	4,033,682.22		
<b>Total unadjusted debits</b>		<b>\$6,341,242.29</b>	
<b>Grand total</b>		<b>\$544,305,614.44</b>	

## GENERAL BALANCE SHEET.

December 31, 1916.

## LIABILITIES.

<b>Capital stock:</b>			
Common stock		\$110,839,100.00	
<b>Long term debt:</b>			
Bonds held by the public	\$176,487,900.00		
Bonds held by trustees, account sinking funds	23,466,700.00		
Bonds owned by the Company, unpledged	13,758,400.00		
Bonds owned by the Company, pledged	31,000.00		
<b>Total</b>	<b>\$213,744,000.00</b>		
Less bonds held by or for the Company, included in above	37,256,100.00		
<b>Total long term debt</b>		<b>\$176,487,900.00</b>	
<b>Current liabilities:</b>			
Traffic and car-service balances payable	\$1,765,513.62		
Audited accounts and wages payable	6,397,244.63		
Miscellaneous accounts payable	435,338.74		
Interest matured unpaid	1,707,081.00		
Dividends matured unpaid	551.25		
Funded debt matured unpaid	5,000.00		
Unmatured interest accrued	1,079,167.50		
Other current liabilities	32,366.49		
<b>Total current liabilities</b>		<b>\$11,422,263.23</b>	
<b>Unadjusted credits:</b>			
Tax liability	\$2,701,635.78		
Insurance reserves	1,409,144.70		
Operating reserves	440,000.00		
Accrued depreciation—Equipment	35,969,880.45		
Other unadjusted credits	1,945,434.90		
<b>Total unadjusted credits</b>		<b>\$42,466,095.83</b>	
<b>Corporate surplus:</b>			
Additions to property since June 30, 1907, through income	\$40,527,499.29		
Funded debt retired through income	15,436,692.85		
Sinking fund reserves	24,079,659.03		
Appropriated surplus not specifically invested	8,564,856.78		
Profit and loss	114,481,547.43		
<b>Total corporate surplus</b>		<b>\$203,090,255.38</b>	
<b>Grand total</b>		<b>\$544,305,614.44</b>	

## INCOME ACCOUNT.

## OPERATING INCOME.

## Railway operating revenues:

## Transportation:

Freight	\$77,310,516.00	
Passenger	21,833,534.25	
Excess baggage	248,822.67	
Parlor and chair car	2,393.89	
Mail	2,691,304.66	
Express	2,854,713.02	
Other passenger train	47,483.90	
Milk	455,545.22	
Switching	1,458,247.48	
Special service train	37,522.31	\$106,940,083.40

## Incidental:

Dining and buffet	\$678,284.43
Hotel and restaurant	100,130.24
Station and train privileges	8,260.33
Parcel room	15,438.48
Storage—Freight	42,365.15

Storage—Baggage	18,891.74
Demurrage	388,408.57
Telegraph and telephone	258,556.09
Stock yards	326,798.52
Rent of buildings and other property	141,264.52
Miscellaneous	171,131.17
	\$2,149,529.24

Joint facility—Cr.	\$106,359.14
Joint facility—Dr.	4,767.29
	\$101,591.85

<b>Total railway operating revenues</b>	<b>\$109,191,204.49</b>
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## Railway operating expenses:

Maintenance of way and structures	\$12,203,996.81
Maintenance of equipment	17,053,851.51
Traffic	1,662,805.07
Transportation	32,014,949.04
Miscellaneous operations	1,013,164.78



General .....	2,203,307.74	
Transportation for investment—C1. ....	916,370.29	\$ 65,235,704.66
Net revenue from railway operations .....		\$43,955,499.83
Railway tax accruals.....	\$ 4,820,197.37	
Uncollectible railway revenues .....	36,314.88	\$ 4,856,512.25
Total operating income .....		\$39,098,987.58
NONOPERATING INCOME:		
Hire of equipment.....	\$ 946,286.33	
Joint facility rent income..	445,698.16	
Income from lease of road.	2,902.12	
Miscellaneous rent income.	171,994.24	
Miscellaneous nonoperating physical property .....	9,931.03	
Miscellaneous income .....	1,302.25	
Dividend income .....	40,353.04	
Income from funded securities .....	32,041.19	
Income from unfunded securities and accounts....	1,337,350.59	
Income from sinking funds .....	3,457.81	2,991,316.76
Gross income .....		\$42,090,304.34
DEDUCTIONS FROM GROSS INCOME:		
Hire of equipment.....	\$ 221,792.24	
Joint facility rents .....	1,734,964.75	

Rent for leased roads.....	35,153.70	
Miscellaneous rents .....	21,530.26	
Miscellaneous tax accruals.	13,585.26	
Separately operated properties—Loss .....	52,136.96	
Interest on funded debt...	6,960,493.46	
Interest on unfunded debt.	752.94	
Amortization of discount on funded debt .....	55,163.52	
Miscellaneous income charges .....	5.60	9,095,578.69
Net income .....		\$32,994,725.65
DISPOSITION OF NET INCOME:		
Income applied to sinking funds .....	\$ 1,864,286.81	
Dividend appropriations of income:		
2 per cent March 25, 1916..	2,216,782.00	
2 per cent June 25, 1916..	2,216,782.00	
2 per cent Sept. 25, 1916..	2,216,782.00	
2 per cent Dec. 26, 1916..	2,216,782.00	8,867,128.00
Income appropriated for investment in physical property .....	8,864,595.48	
Fund for accrued taxes—not yet due.....	2,400,000.00	
Miscellaneous appropriations of income.....	6,000,000.00	\$27,996,010.29
Income balance transferred to profit and loss.....		\$ 4,998,715.36

## COLORADO &amp; SOUTHERN RAILWAY COMPANY—EIGHTEENTH ANNUAL REPORT

CHICAGO, January 1, 1917.

To the Stockholders of The Colorado &amp; Southern Railway Company:

Herewith is submitted the Eighteenth Annual Report of your Board of Directors for the year ended December 31, 1916. In order to conform with the orders of the Interstate Commerce Commission, your Board of Directors amended the By-Laws of the Company so that the fiscal year begins on January 1st and ends on December 31st each year.

The following report sets forth comparative statements for the newly adopted fiscal period and combines the operations and affairs of the Lines operated by the Company named on the preceding page and which are herein designated as the

"COLORADO & SOUTHERN LINES."  
FISCAL YEAR JANUARY 1 TO DECEMBER 31.

Per Cent.	1916.	OPERATING REVENUES.	1915.	Per Cent.
72.56	\$11,951,001.01	Freight .....	\$10,560,926.15	71.62
21.39	3,522,954.82	Passenger .....	3,260,469.11	22.11
1.42	233,182.07	Mail .....	235,172.84	1.60
1.32	217,427.69	Express .....	230,155.82	1.56
2.11	346,961.23	Miscellaneous .....	277,138.54	1.88
1.09	179,361.71	Incidental .....	166,762.71	1.13
.11	18,390.07	Joint facility .....	15,039.98	.10
100.00	\$16,469,278.60	Total operating revenues...	\$14,745,665.15	100.00
OPERATING EXPENSES.				
11.43	\$ 1,881,738.25	Maintenance of way and structures .....	\$ 1,944,310.58	13.19
17.13	2,821,367.31	Maintenance of equipment...	2,769,214.07	18.78
1.30	213,672.29	Traffic .....	202,159.71	1.37
28.00	4,611,102.77	Transportation .....	4,604,376.93	31.22
.47	77,751.21	Miscellaneous .....	76,130.31	.52
2.91	479,699.87	General .....	475,085.10	3.22
61.24	\$10,085,331.70	Total operating expenses...	\$10,071,276.70	68.30
38.76	\$ 6,383,946.90	Net revenue from operations.	\$ 4,674,388.45	31.70
.....	\$ 757,611.27	Railway tax accruals.....	\$ 666,183.56	.....
.....	716.83	Uncollectible railway revenues .....	299.19	.....
.....	\$ 758,328.10		\$ 666,482.75	.....
.....	\$ 5,625,618.80	Operating income .....	\$ 4,007,905.70	.....
NONOPERATING INCOME.				
.....	\$ 631,545.89	Rents .....	\$ 509,968.42	.....
.....	90,615.49	Miscellaneous interest ....	58,101.45	.....
.....	\$ 722,161.38	Total nonoperating income..	\$ 568,069.87	.....
.....	\$ 6,347,780.18	Gross income .....	\$ 4,575,975.57	.....
DEDUCTIONS FROM GROSS INCOME.				
.....	\$ 333,733.78	Rents .....	\$ 491,008.70	.....
.....	2,860,328.95	Interest on funded debt....	2,859,257.37	.....
.....	835.20	Interest on unfunded debt..	1,728.82	.....
.....	18,600.06	Amortization of discount on funded debt .....	18,974.96	.....
.....	123,055.03	Miscellaneous income charges.	96,856.18	.....
.....	\$ 3,336,553.02	Total deductions .....	\$ 3,467,826.03	.....
.....	\$ 3,011,227.16	Net income .....	\$ 1,108,149.54	.....
DISPOSITION OF NET INCOME.				
.....	\$ 67,432.24	Appropriations for: Sinking funds .....	\$ 68,301.22	.....
.....	170,000.00	Dividends .....		.....

.....	280,220.33	...Additions and betterments...	.....
.....	500,000.00	Miscellaneous appropriations of income .....	.....
.....	\$ 1,017,652.57	Total appropriations of income \$	68,301.22

..... \$ 1,993,574.59 ..... Income balance ..... \$ 1,039,848.32 .....  
Certain statements for the six months ended Dec. 31st, 1916, appear at the end of this report.

Compared with the preceding year, the total operating revenues show an increase of \$1,723,613.45 or 11.68%. The operating expenses show an increase of \$14,055.00 or 00.13%. The net operating revenue shows an increase of \$1,709,558.45 or 36.57%.

Taxes increased \$91,427.71 over the preceding year due to increases in assessments by the Federal Government and in tax levies in Colorado, Wyoming, New Mexico and Texas.

Operating income shows an increase of \$1,617,713.10 or 40.36%. The percentage of operating revenues required for operating expenses was 61.24% as compared with 68.30% in the previous year.

It required 45.06% of the Gross Income to meet interest on funded debt this year as compared with 62.48% in the previous year.

As indicated, the operations reflected in the accompanying statements and report are those for the year ended December 31st, 1916, during part of which numerous items of expense have been affected by increased cost of materials and labor. These increases will affect the Operating Expenses throughout the whole of the year 1917, and there will also be large additional expenses now accruing through the increase in wages resulting from the "so-called" Adamson Law, effective Jan. 1st, 1917, and through increases in other wages, which have been granted or are in process of negotiation. The 1917 figures will also reflect the more recent increases in cost of locomotive fuel and materials and supplies accruing on account of economic and other conditions affecting the country as a result of the European War and conditions related thereto. Pending revenue measures likewise indicate a substantial increase in taxes payable during the coming year.

During the year the following Long Term Debt obligations have been retired:

First mortgage bonds of the C. S. & C. C. D. Ry. Co. through sinking fund .....	\$ 68,000.00
Deferred rentals under equipment leases.....	254,000.00

Making net decrease in Long Term Debt of.....	\$322,000.00
There were charges to Capital Account aggregating \$163,191.39 for additions and betterments to property. This amount was expended for:	
Structures and machinery.....	\$ 17,959.61
Bridges .....	116,103.38
Tracks .....	82,310.58
Land .....	38,479.49
Laying tie plates, main line.....	37,303.50
Various other additions and betterments.....	62,628.69
Equipment .....	114,702.20

.....	\$469,487.45
Less:	
Equipment retired .....	306,296.06

\$163,191.39  
During the year a number of spur tracks and industry tracks were abandoned, as they were of no further service to the Company, and credits equal to the original cost of the property were passed to the various additions and betterments accounts.

The operating results of the receiver of The Trinity & Brazos Valley Railway Company show a deficit in the net operating revenue of \$94,836.31, to which there was added, for tax and miscellaneous items, \$84,199.40, creating a net income deficit for the year of \$179,035.71.

The following is the report of the General Auditor, with statements prepared by him.

By order of the Board of Directors.

HALE HOLDEN,  
President.

## GENERAL BALANCE SHEET—ASSET SIDE.

December 31, 1916.

INVESTMENTS.	
Investment in road and equipment.....	\$111,308,508.12
Sinking funds .....	521.47
Deposits in lieu of mortgage property sold.....	18,393.31
Miscellaneous physical property.....	4,660.00
Investment in affiliated companies:	
Stocks .....	\$ 449,709.94
Bonds .....	8,760,000.00
Notes .....	1,440,498.05
Advances .....	30,281.77
10,680,489.76	
Other investments:	
Stocks .....	\$1,021,610.30
Advances .....	420,021.05
1,441,631.35	
Total investments .....	\$123,454,204.01
CURRENT ASSETS.	
Cash .....	\$ 2,682,200.64
Time drafts and deposits .....	2,970,000.00
Special deposits .....	137,904.33
Loans and bills receivable.....	7,950.00
Traffic and car service balances receivable.....	525,693.23
Net balance receivable from agents and conductors.....	296,492.22
Miscellaneous accounts receivable.....	425,003.80
Material and supplies.....	1,233,355.93
Rents receivable .....	18,785.29
Other current assets .....	31,935.02
Total current assets .....	\$ 8,329,320.46
DEFERRED ASSETS.	
Working fund advances.....	\$ 1,475.15
Other deferred assets .....	70,773.03
Total deferred assets .....	\$ 72,248.18
UNADJUSTED DEBITS.	
Rents and insurance premiums paid in advance.....	\$ 8,978.98
Discount on funded debt.....	271,153.79
Other unadjusted debits .....	69,775.52
Securities issued or assumed—Unpledged.....	\$5,218,446.55
Total unadjusted debits.....	\$ 349,908.29
Grand Total .....	\$132,205,680.94

## GENERAL BALANCE SHEET—LIABILITY SIDE.

December 31, 1916.

STOCK.	
Capital stock:	
Common stock .....	\$ 31,021,484.00
Preferred stock .....	17,000,000.00
Total stock .....	\$ 48,021,484.00
LONG TERM DEBT.	
Funded debt unmatured—	
Total book liability .....	\$67,634,346.55
Held by carriers .....	5,218,446.55
Actually outstanding .....	\$ 62,415,900.00
CURRENT LIABILITIES.	
Traffic and car service balances payable.....	\$ 573,582.33
Audited accounts and wages payable.....	992,929.02
Miscellaneous accounts payable.....	5,596.51
Interest matured unpaid .....	126,231.25
Dividends matured unpaid .....	245.12
Unmatured interest accrued .....	624,065.91
Unmatured rents accrued .....	9,401.48
Other current liabilities .....	156,783.21
Total current liabilities .....	\$ 2,488,834.83
DEFERRED LIABILITIES.	
Other deferred liabilities .....	\$ 7,284.18
UNADJUSTED CREDITS.	
Tax liability .....	\$ 433,726.37
Accrued depreciation—Equipment .....	5,043,187.51
Other unadjusted credits .....	143,277.93
Total unadjusted credits .....	\$ 5,620,191.81
CORPORATE SURPLUS.	
Additions to property through income and surplus.....	\$ 6,498,972.87
Funded debt retired through income and surplus.....	500,000.00
Sinking fund reserves .....	34,742.63
Appropriated surplus not specifically invested.....	2,000,000.00
Profit and loss credit balance.....	4,618,270.62
Total corporate surplus.....	\$ 13,651,986.12
Grand Total .....	\$132,205,680.94

## INCOME ACCOUNT.

## OPERATING INCOME.

Railway operating revenues:	
Transportation:	
Freight .....	\$11,951,001.01
Passenger .....	3,522,954.82
Excess baggage .....	28,372.04
Mail .....	233,182.07
Express .....	217,427.69
Other passenger-train .....	2,186.56
Switching .....	304,010.55
Special service train.....	11,461.34
Other freight train.....	930.74
\$16,271,526.82	
Incidental:	
Dining and buffet.....	\$ 80,120.25
Hotel and restaurant.....	1,760.25
Station and train privileges.....	22,068.78
Parcel room .....	1,359.73
Storage—Freight .....	3,613.16
Storage—Baggage .....	4,116.76
Demurrage .....	50,632.66
Rents of buildings and other property .....	7,159.17
Miscellaneous .....	8,530.95
179,361.71	
Joint facility:	
Joint facility—Cr. ....	\$ 18,436.89
Joint facility—Dr. ....	46.82
18,390.07	
Total railway operating revenues.....	\$16,469,278.60
Railway operating expenses:	
Maintenance of way and structures .....	
Maintenance of equipment.....	\$ 1,881,738.25
Traffic .....	2,821,367.31
Transportation .....	213,672.29
Miscellaneous operations .....	4,611,102.77
General .....	77,751.21
479,699.87	
10,085,331.70	
Net revenue from railway operations....	\$6,383,946.90
Railway tax accruals .....	\$ 757,611.27
Uncollectible railway revenues.....	716.83
758,328.10	
Total operating income .....	\$5,625,618.80

## NONOPERATING INCOME.

Hire of equipment.....	\$ 319,813.13
Joint facility rent income.....	30,028.04
Income from lease of road.....	263,584.82
Miscellaneous rent income.....	18,119.90
Separately operated properties—Profit.....	1,624.32
Income from unfunded securities and accounts.....	88,991.17
722,161.38	
Gross income .....	\$6,347,780.18
DEDUCTIONS FROM GROSS INCOME.	
Hire of equipment .....	\$ 264,837.59
Joint facility rents .....	55,274.46
Miscellaneous rents .....	13,621.73
Separately operated properties—Loss.....	33,636.22
Interest on funded debt.....	2,860,328.95
Interest on unfunded debt.....	835.20
Amortization of discount on funded debt.....	18,600.06
Miscellaneous income charges.....	89,418.81
3,336,553.02	
Net income .....	\$3,011,227.16

## DISPOSITION OF NET INCOME.

Income applied to sinking funds.....	\$ 67,432.24
Dividend appropriations of income:	
First preferred stock—	
2 per cent., payable Oct. 10, 1916.....	170,000.00
Income appropriated for investment in physical property .....	280,220.33
Miscellaneous appropriations of income.....	500,000.00
1,017,652.57	
Income balance transferred to Profit and Loss..	\$1,993,574.59

## PROFIT AND LOSS ACCOUNT.

## CREDIT.

Credit balance at beginning of year.....	\$ 3,233,879.71
Credit balance transferred from income.....	1,993,574.59
Miscellaneous credits .....	40,613.03
\$5,268,067.33	
DEBIT.	
Dividend appropriations of surplus.....	\$ 527.68
Miscellaneous appropriations of surplus.....	500,000.00
Loss on retired road and equipment.....	95,585.04
Miscellaneous debits .....	53,683.99
649,796.71	
Credit balance carried to balance sheet.....	\$4,618,270.62

[Adv.]



## Railway Officers

### Executive, Financial, Legal and Accounting

F. A. Deverell, general auditor of the Cincinnati, Hamilton & Dayton at Cincinnati, Ohio, has been appointed assistant general auditor of the Baltimore & Ohio, reporting to the general auditor; W. E. Rittenhouse has been appointed assistant auditor merchandise receipts, reporting to the auditor of merchandise receipts, and J. G. Westbrook has been appointed special accountant, reporting to the general auditor. All with headquarters at Cincinnati, Ohio.

Morley Donaldson, vice-president and general manager of the Grand Trunk Pacific, at Winnipeg, Man., has resigned on account of ill health. He was born in Edinburgh, Scotland, on May 1, 1851, and was educated privately in France and Canada. He was for some time in the engine works of E. Gilbert & Co., Montreal, and later served under Walter and Frank Shanly during the construction of the Hoosac Tunnel, Massachusetts. In 1881 he entered the service of the Canada Atlantic as chief draughtsman, and later served successively as mechanical superintendent, superintendent of traffic and mechanical departments, and as general superintendent until the Canada Atlantic became merged with the Grand Trunk in 1905, when he became superintendent of the Ottawa division of the Grand Trunk. He was appointed vice-president and general manager of the Grand Trunk Pacific in 1912, and has been a member of the Canadian Society of Civil Engineers since 1889.

William Pittman Hinton, traffic manager of the Grand Trunk Pacific, at Winnipeg, Man., has been appointed vice-president and general manager, with headquarters at Winnipeg. He was



W. P. Hinton

born on August 30, 1871, at Ottawa, Ont., and was educated at Ottawa Collegiate Institute. On May 3, 1887, he began railway work in the auditor's department of the Canada Atlantic, and in September, 1891, became rate clerk in the traffic department. From March, 1896, to July, 1901, he was assistant general freight agent, and then was general freight agent, until his appointment in February, 1903, as general freight and passenger agent of the same road. In October, 1905, when the Grand Trunk absorbed the Canada Atlantic he became general agent in the passenger department of the Grand Trunk at Ottawa, Ont., in charge of immigration and transatlantic passenger traffic, remaining in that position until January 1, 1907, when he was appointed assistant general passenger agent of the Grand Trunk at Montreal. On May 1, 1909, he was appointed general passenger agent of the Grand Trunk Pacific at Winnipeg, Man., and in January, 1914, was promoted to assistant passenger traffic manager of the same road at Winnipeg. The following October he was promoted to assistant passenger traffic manager of the Grand Trunk and Grand Trunk Pacific lines, with headquarters at Montreal, Que. In November, 1915, he returned to Winnipeg as traffic manager of the Grand Trunk Pacific, having charge of both freight and passenger traffic; he was appointed at the same time to represent also the Canadian Government Railways with the title of western traffic manager, and now becomes vice-president and general manager of the Grand Trunk Pacific, also of the Grand Trunk Pacific Coast Steamship Company, Limited, with headquarters at Winnipeg.

### Operating

R. King, assistant superintendent of the Canadian Government Railways at Winnipeg, Man., has been appointed acting superintendent, with headquarters at Fort William, Ont.; D. W. Steeper has been appointed acting assistant superintendent, with office at Graham, Ont.; J. H. Brassard has been appointed chief train dispatcher, with office at Levis, Que., and J. J. McLeod has been appointed chief train dispatcher at New Glasgow, N. S.

M. F. Leamy, trainmaster of the Delaware & Hudson at Albany, N. Y., has been appointed superintendent of the Saratoga division, with headquarters at Albany; L. A. Crounse succeeds Mr. Leamy; J. W. Nolan has been appointed assistant trainmaster, succeeding F. R. Griffin, assigned to other duties; H. S. Sloat has been appointed chief train dispatcher, succeeding Mr. Crounse, and C. E. Chubb has been appointed night chief train dispatcher, succeeding Mr. Sloat. All with headquarters at Albany.

C. R. Morrill, who has been appointed assistant general manager of the Southern Pacific at Houston, Tex., was born at St. Louis, Mo., on October 12, 1869, and entered railway service with the Southern Pacific in April, 1892, as a rodman, and served successively until 1897 as a chainman, draftsman and instrumentman. On the latter date he became roadmaster, and four years later was promoted to division engineer. In July, 1904, he became assistant superintendent, and in January, 1915, was appointed superintendent, with headquarters at Houston, which position he held until his appointment as assistant general manager.

### Traffic

M. Walsh, traffic manager of the Georgia Coast & Piedmont at Brunswick, Ga., has resigned and the office of traffic manager, has been abolished. Effective August 8.

W. M. Hardin, whose appointment as general freight agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, Minn., was announced in the *Railway Age Gazette* of August 10, was born at Independence, Mo., on May 3, 1878, and entered railway service in July, 1895, as a station helper on the Chicago & Alton. In the early part of 1898 he became telegraph operator with the Chicago, St. Paul, Minneapolis & Omaha, and in September of that year he went to the Minneapolis & St. Louis in the same capacity. Later he served successively as relief agent and traveling freight agent until January 1, 1909, when he was appointed commercial agent, with headquarters at Kansas City, Mo. On January 1, 1912, he was transferred to Minneapolis, and on November 1, 1915, was promoted to assistant general freight agent at Minneapolis, which position he held until his recent appointment as general freight agent, as already noted.



W. M. Hardin

F. J. Parker, chief clerk of the general freight agent of the Michigan Central, at Detroit, Mich., has been appointed division freight agent, with the same headquarters.

Joseph W. Hickson has been appointed general Canadian freight agent of the New York Central, with headquarters at Toronto, Ont., in place of William A. Wilson, who has retired under the pension system.

S. G. Linderbeck, district passenger agent of the Seaboard Air Line, at Tampa, Fla., has been appointed division passenger agent, with headquarters at Jacksonville, and R. E. Camp has been appointed district passenger agent at Tampa, vice Mr. Linderbeck.

Lawrence Snapp, chief clerk in the passenger department of the Pittsburgh & Lake Erie, has been appointed assistant general passenger agent, with headquarters at Pittsburgh, Pa., succeeding W. B. Morris, resigned.

L. F. Vosburgh, general passenger agent of the New York Central at New York, has been appointed passenger traffic manager, and C. C. Howard, assistant general passenger agent at New York, has been appointed general passenger agent. Both with headquarters at New York.

F. La Bau, freight traffic manager of the New York Central at New York, has been appointed traffic manager; W. A. Newman, general freight agent at New York, has been appointed freight traffic manager, and G. C. Woodruff, division freight agent of the New York Central and the West Shore at Albany, N. Y., has been appointed general freight agent of both roads. All with offices at New York.

J. L. Amos, general agent of the freight department of the Missouri Pacific, with headquarters at St. Louis, Mo., has been appointed general freight agent, with headquarters at Kansas City, succeeding A. T. Stewart, resigned to become general traffic manager of the Sinclair Refining Company at Chicago; H. N. Atwood, general agent of the freight department at Milwaukee, Wis., has been transferred to St. Louis.

F. L. Jenkins, division passenger agent of the Southern Railway at Birmingham, Ala., has been appointed division passenger agent at Jacksonville, Fla.; G. R. Pettit, division passenger agent at Jacksonville, has been appointed district passenger agent at New York, N. Y., and T. J. Connell, division passenger agent at St. Louis, Mo., has been appointed special passenger representative at Atlanta, Ga.

The positions of New England freight agent, at Boston, Mass., and of commercial agent at Boston of the Seaboard Air Line, have been consolidated, and F. J. Cook, who was commercial agent at Boston, is now New England freight agent, with office at Boston; F. C. Cheney has been appointed commercial agent, at Greenville, S. C., vice N. M. Martin, resigned, and B. H. Hartley has been appointed commercial agent at Atlanta to succeed Mr. Cheney.

Bruce F. Moffatt, whose appointment as assistant freight traffic manager of the Minneapolis & St. Louis, was announced in the *Railway Age Gazette* of August 10, was born at Iola, Kan., on March 28, 1873, and entered railway service with the Iowa Central in 1893, in the local office at Marshalltown, Iowa. He served successively with that company in the auditor's office, the general freight department, and as traveling freight agent in Iowa. He later became commercial agent of the Minneapolis & St. Louis and the Iowa Central, at St. Paul, Minn., in which capacity he served until November 1, 1915, when he was appointed assistant general freight agent of the Minneapolis & St. Louis, with headquarters at Minneapolis, which position he held until his recent appointment as assistant freight traffic manager.

#### Engineering and Rolling Stock

H. A. Empie has been appointed general fuel agent of the Delaware & Hudson, with headquarters at Albany, N. Y.

T. L. Reed, master mechanic of the Seaboard Air Line at Hamlet, N. C., has been appointed master mechanic of the Georgia division, with headquarters at Howells, Ga.

Richard J. Vaughn, roadmaster on the Union Pacific at Evanston, Wyo., has been appointed general roadmaster, with headquarters at Omaha, Neb., succeeding Thomas Scott, resigned.

J. M. Grant has been appointed engineer maintenance of way on the Chicago, Peoria & St. Louis, with headquarters at Springfield, Ill., vice E. A. Froyd, who has been commissioned a captain in the United States Army.

A. L. Moler has been appointed master mechanic of the Saratoga and Champlain divisions of the Delaware & Hudson, with office at Colonie, N. Y., succeeding J. H. Stranahan, who has been transferred to the operating department.

W. Wells, division master mechanic on the Algoma district of the Canadian Pacific at Sudbury, Ont., has been appointed division master mechanic, with office at Schreiber, vice F. Grant transferred; T. Hambley, acting master mechanic at North Bay,

has been appointed division master mechanic, with office at Sudbury, vice Mr. Wells; and C. Gribbin has been appointed master mechanic, with office at North Bay, vice Mr. Hambley.

T. J. Skillman, division engineer of the Monongahela division of the Pennsylvania Railroad at Pittsburgh, Pa., has been appointed division engineer, office of the principal assistant engineer, New Jersey division, with headquarters at New York City, and W. F. Greene, division engineer of the Delaware division at Wilmington, Del., has been appointed division engineer, Monongahela division, with headquarters at Pittsburgh, Pa., succeeding Mr. Skillman.

H. S. Rogers, maintenance engineer of the Delaware & Hudson at Albany, N. Y., has been appointed division engineer in charge of maintenance of way forces on the Susquehanna division, with headquarters at Oneonta, N. Y.; F. C. Hohn has been appointed division engineer on the Pennsylvania division, with headquarters at Carbondale, Pa., and G. D. Hughey has been appointed division engineer on the Champlain division, with headquarters at Plattsburg, N. Y.

John J. Hanlin, whose appointment as assistant superintendent of motive power of the Seaboard Air Line with headquarters at Portsmouth, Va., has already been announced in these columns, was born on June 1, 1871, in Texas county, Missouri. He was educated in the common schools and in 1888 became an apprentice at the Birmingham Foundry & Machine Company, and four years later, on the completion of his apprenticeship, became a machinist on the Louisville & Nashville, remaining in that position until 1900. He was then appointed general foreman of the Birmingham Southern at Birmingham, Ala., and in 1904 became general foreman on the Seaboard Air Line at the same place. In 1907 he was appointed master mechanic at Atlanta, Ga., which position he held until his recent appointment as assistant superintendent of motive power of the same road, as above noted.



J. J. Hanlin

#### OBITUARY

Edward Dickinson, formerly receiver of the Kansas City, Mexico & Orient, died at his summer home at Miltons, Minn., on August 9. He was born at Cumberland, Md., on October 8, 1850, and entered railway service as a messenger in the freight office of the Cleveland & Toledo, at Cleveland, Ohio, in October, 1861. In 1865 he became telegraph operator on the Atlantic & Great Western, and in 1868 was promoted to assistant train dispatcher. For a short time in 1869 he was clerk and telegraph operator on the Union Pacific at Omaha, Neb., and in 1870 he became train baggage man and express messenger on the Atlantic & Great Western. In 1872 he was appointed train dispatcher on the Nebraska division of the Union Pacific, and served successively until July, 1890, as chief dispatcher of the Laramie division, superintendent of the same division, general superintendent of the Wyoming division, assistant general superintendent, general superintendent and general manager of the Missouri river division. On the latter date he became general superintendent of the trans-Ohio division of the Baltimore & Ohio, at Chicago, and one year later was appointed assistant general manager of the Union Pacific. In April, 1893, he was promoted to general manager, and in November, 1902, became vice-president and general manager of the Kansas City, Mexico & Orient, which position he held until March, 1912, when he was appointed receiver.